Vol. 1182 Number 5

OFFICIAL GAZETTE

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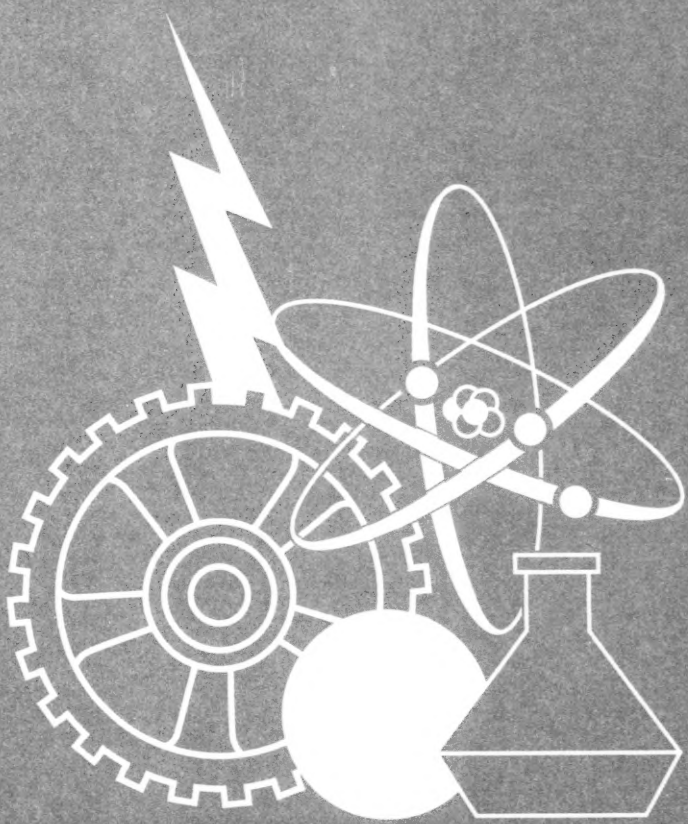
UNITED STATES PATENT AND TRADEMARK OFFICE

to:

PATENTS

January 30, 1996



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

January 30, 1996 Volume 1182 Number 5

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1181 O.G. 50, on December 19, 1995.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective June 20, 1995, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

International fees were changed, effective on January 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1995, and were announced in the *Official Gazette* at 1177 O.G. 171, on August 29, 1995.

The schedule of PCT fees (in U.S. dollars), effective January 1, 1996, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	220.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	660.00
—Corresponding prior U.S. national application filed	430.00
—Supplemental search fee, per additional invention (payable only upon invitation)	190.00
European Patent Office as ISA	1700.00
International fees	
Basic fee	677.00
Basic Supplemental fee (for each page over 30)	13.00
Designation fee per country or region	
—For the first 11 national or regional offices designated	164.00
—For each designation in excess of 11 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
—Designation fee	164.00
—Confirmation fee	82.00
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	207.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—USPTO was ISA in PCT Chapter I	470.00
—Additional examination fee, per additional invention (payable only upon invitation)	140.00
—USPTO was not ISA in PCT Chapter I	710.00
—Additional examination fee, per additional invention (payable only upon invitation)	250.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
—All claims presented satisfied provisions of PCT Article 33(2) to (4)	47.00	94.00
—All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	340.00	680.00
USPTO was ISA but not IPEA	375.00	750.00
USPTO was neither ISA nor IPEA		
—Search report has not been prepared by the European Patent Office or the Japanese Patent Office	505.00	1010.00
—Search report has been prepared by the European Patent Office or the Japanese Patent Office	440.00	880.00
Other National fees		
—For each independent claim in excess of 3	39.00	78.00
—For each claim in excess of 20	11.00	22.00
—For each application containing a multiple dependent claim	125.00	250.00
—Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Nov. 27, 1995

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

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Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on January 26, 1993 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,181,273 through 5,181,274
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 24, 1989 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,799,272 through 4,800,591
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 22, 1985 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,494,245 through 4,495,656
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1994, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $495.00
By other than a small entity $990.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $995.00
By other than a small entity $1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,495.00
By other than a small entity $2,990.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $660.00
(2) unintentional $1,550.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED November 22, 1995
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,469	06/724,471	08/11/87
(4,416,330)	(06/350,283)	(11/22/83)
Re. 33,091	06/800,584	10/17/89
(4,416,248)	(06/282,261)	(11/22/83)
Re. 33,412	07/446,501	10/30/90
(4,706,712)	(06/845,142)	(11/17/87)
Re. 34,509	07/913,441	01/18/94
(5,065,512)	(07/432,844)	(11/19/91)
4,416,028	06/230,942	11/22/83
4,416,029	06/262,635	11/22/83
4,416,030	06/431,297	11/22/83
4,416,044	06/246,214	11/22/83
4,416,047	06/308,552	11/22/83
4,416,048	06/326,019	11/22/83
4,416,049	06/223,446	11/22/83
4,416,052	06/363,195	11/22/83
4,416,058	06/231,848	11/22/83
4,416,059	06/332,179	11/22/83
4,416,060	06/265,784	11/22/83
4,416,065	06/343,825	11/22/83
4,416,089	06/252,516	11/22/83
4,416,106	06/366,478	11/22/83
4,416,107	06/369,121	11/22/83
4,416,113	06/216,436	11/22/83
4,416,115	06/267,857	11/22/83
4,416,119	06/338,581	11/22/83
4,416,121	06/324,353	11/22/83
4,416,132	06/479,017	11/22/83
4,416,135	06/300,758	11/22/83
4,416,154	06/291,906	11/22/83
4,416,155	06/349,622	11/22/83
4,416,159	06/312,494	11/22/83
4,416,164	06/235,054	11/22/83
4,416,170	06/479,106	11/22/83
4,416,175	06/344,479	11/22/83
4,416,182	06/305,051	11/22/83
4,416,184	06/266,087	11/22/83
4,416,193	06/346,014	11/22/83
4,416,197	06/311,346	11/22/83
4,416,198	06/370,622	11/22/83
4,416,199	06/413,705	11/22/83
4,416,207	06/357,557	11/22/83
4,416,208	06/268,138	11/22/83
4,416,209	06/256,429	11/22/83
4,416,213	06/347,220	11/22/83
4,416,224	06/340,256	11/22/83
4,416,228	06/337,855	11/22/83
4,416,229	06/278,653	11/22/83
4,416,235	06/301,748	11/22/83
4,416,241	06/287,002	11/22/83
4,416,243	06/370,069	11/22/83
4,416,257	06/269,038	11/22/83

Patent Number	Serial Number	Issue Date
4,416,261	06/320,248	11/22/83
4,416,267	06/329,182	11/22/83
4,416,272	06/257,236	11/22/83
4,416,273	06/273,662	11/22/83
4,416,275	06/332,938	11/22/83
4,416,278	06/265,075	11/22/83
4,416,298	06/356,566	11/22/83
4,416,299	06/292,653	11/22/83
4,416,300	06/305,620	11/22/83
4,416,307	06/320,469	11/22/83
4,416,311	06/285,117	11/22/83
4,416,317	06/326,401	11/22/83
4,416,318	06/358,451	11/22/83
4,416,319	06/401,339	11/22/83
4,416,320	06/398,387	11/22/83
4,416,321	06/280,213	11/22/83
4,416,328	06/317,452	11/22/83
4,416,333	06/370,017	11/22/83
4,416,335	06/328,309	11/22/83
4,416,345	06/315,048	11/22/83
4,416,349	06/306,951	11/22/83
4,416,351	06/254,215	11/22/83
4,416,352	06/349,485	11/22/83
4,416,355	06/477,284	11/22/83
4,416,367	06/297,099	11/22/83
4,416,372	06/427,390	11/22/83
4,416,374	06/368,917	11/22/83
4,416,382	06/360,378	11/22/83
4,416,383	06/316,239	11/22/83
4,416,385	06/333,626	11/22/83
4,416,386	06/358,066	11/22/83
4,416,395	06/305,922	11/22/83
4,416,398	06/347,887	11/22/83
4,416,399	06/272,908	11/22/83
4,416,406	06/329,289	11/22/83
4,416,410	06/384,474	11/22/83
4,416,412	06/397,660	11/22/83
4,416,414	06/400,898	11/22/83
4,416,420	06/353,370	11/22/83
4,416,425	06/370,086	11/22/83
4,416,437	06/364,588	11/22/83
4,416,441	06/423,561	11/22/83
4,416,446	06/281,363	11/22/83
4,416,447	06/299,179	11/22/83
4,416,456	06/258,053	11/22/83
4,416,460	06/250,249	11/22/83
4,416,466	06/260,754	11/22/83
4,416,468	06/256,477	11/22/83
4,416,469	06/256,530	11/22/83
4,416,472	06/219,323	11/22/83
4,416,474	06/224,080	11/22/83
4,416,475	06/448,242	11/22/83
4,416,480	06/299,810	11/22/83
4,416,482	06/222,247	11/22/83
4,416,486	06/253,744	11/22/83
4,416,490	06/317,718	11/22/83
4,416,495	06/270,736	11/22/83
4,416,497	06/286,746	11/22/83
4,416,500	06/318,904	11/22/83
4,416,507	06/261,178	11/22/83
4,416,517	06/350,122	11/22/83
4,416,521	06/267,749	11/22/83
4,416,531	06/364,653	11/22/83
4,416,535	06/382,354	11/22/83
4,416,537	06/266,396	11/22/83
4,416,540	06/323,953	11/22/83
4,416,543	06/298,366	11/22/83
4,416,544	06/323,176	11/22/83
4,416,554	06/396,938	11/22/83
4,416,559	06/269,007	11/22/83
4,416,565	06/280,005	11/22/83
4,416,569	06/253,048	11/22/83
4,416,571	06/234,647	11/22/83
4,416,572	06/264,436	11/22/83
4,416,573	06/291,709	11/22/83
4,416,581	06/349,402	11/22/83
4,416,590	06/223,436	11/22/83
4,416,596	06/252,706	11/22/83
4,416,598	06/258,413	11/22/83
4,416,599	06/311,256	11/22/83
4,416,603	06/309,238	11/22/83
4,416,604	06/269,425	11/22/83
4,416,609	06/243,919	11/22/83
4,416,622	06/323,368	11/22/83
4,416,640	06/244,269	11/22/83
4,416,645	06/339,024	11/22/83
4,416,657	06/407,744	11/22/83
4,416,662	06/271,271	11/22/83
4,416,666	06/288,737	11/22/83
4,416,669	06/350,668	11/22/83
4,416,671	06/355,038	11/22/83
4,416,673	06/350,253	11/22/83
4,416,677	06/381,844	11/22/83
4,416,679	06/362,129	11/22/83
4,416,683	06/302,323	11/22/83
4,416,685	06/335,789	11/22/83
4,416,688	06/343,554	11/22/83
4,416,700	06/285,131	11/22/83
4,416,701	06/355,087	11/22/83
4,416,703	06/323,170	11/22/83
4,416,705	06/352,925	11/22/83
4,416,706	06/403,129	11/22/83
4,416,711	06/450,647	11/22/83
4,416,717	06/384,310	11/22/83
4,416,722	06/378,608	11/22/83
4,416,723	06/337,739	11/22/83
4,416,724	06/329,205	11/22/83
4,416,725	06/454,922	11/22/83
4,416,726	06/359,534	11/22/83
4,416,729	06/336,538	11/22/83
4,416,730	06/396,424	11/22/83
4,416,731	06/376,537	11/22/83
4,416,734	06/262,078	11/22/83
4,416,742	06/304,939	11/22/83
4,416,743	06/456,315	11/22/83
4,416,746	06/338,654	11/22/83
4,416,748	06/300,377	11/22/83
4,416,750	06/311,057	11/22/83
4,416,755	06/254,341	11/22/83
4,416,758	06/275,906	11/22/83
4,416,761	06/402,353	11/22/83
4,416,762	06/360,765	11/22/83
4,416,763	06/467,879	11/22/83
4,416,765	06/408,109	11/22/83
4,416,767	06/322,018	11/22/83
4,416,779	06/425,779	11/22/83
4,416,797	06/235,817	11/22/83
4,416,798	06/357,566	11/22/83
4,416,801	06/409,716	11/22/83
4,416,803	06/382,181	11/22/83
4,416,804	06/385,589	11/22/83
4,416,809	06/373,714	11/22/83
4,416,811	06/288,921	11/22/83
4,416,818	06/309,958	11/22/83
4,416,820	06/339,054	11/22/83
4,416,829	06/433,009	11/22/83
4,416,830	06/243,949	11/22/83
4,416,833	06/444,775	11/22/83
4,416,842	06/239,330	11/22/83
4,416,846	06/284,188	11/22/83
4,416,855	06/232,821	11/22/83
4,416,857	06/408,226	11/22/83
4,416,858	06/406,448	11/22/83
4,416,859	06/235,146	11/22/83
4,416,861	06/373,250	11/22/83
4,416,871	06/338,527	11/22/83
4,416,872	06/359,012	11/22/83
4,416,874	06/354,998	11/22/83
4,416,881	06/245,464	11/22/83
4,416,887	06/495,559	11/22/83
4,416,892	06/368,079	11/22/83
4,416,893	06/246,954	11/22/83
4,416,895	06/250,454	11/22/83
4,416,914	06/220,341	11/22/83
4,416,916	06/354,831	11/22/83
4,416,917	06/230,297	11/22/83

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4,416,928	06/376,606	11/22/83
4,416,930	06/364,144	11/22/83
4,416,932	06/425,048	11/22/83
4,416,936	06/334,507	11/22/83
4,416,943	06/286,289	11/22/83
4,416,944	06/452,872	11/22/83
4,416,945	06/345,291	11/22/83
4,416,946	06/365,430	11/22/83
4,416,947	06/364,053	11/22/83
4,416,948	06/364,054	11/22/83
4,416,961	06/349,282	11/22/83
4,416,970	06/427,068	11/22/83
4,416,972	06/277,512	11/22/83
4,416,975	06/361,702	11/22/83
4,416,976	06/249,617	11/22/83
4,416,977	06/349,092	11/22/83
4,416,979	06/375,545	11/22/83
4,416,984	06/266,184	11/22/83
4,416,992	06/362,206	11/22/83
4,416,994	06/312,446	11/22/83
4,416,995	06/300,943	11/22/83
4,417,002	06/396,124	11/22/83
4,417,016	06/350,140	11/22/83
4,417,018	06/378,231	11/22/83
4,417,019	06/405,495	11/22/83
4,417,021	06/252,500	11/22/83
4,417,027	06/389,691	11/22/83
4,417,031	06/337,800	11/22/83
4,417,035	07/320,976	11/22/83
4,417,036	06/356,019	11/22/83
4,417,038	06/327,727	11/22/83
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5,066,854	07/480,205	11/19/91
5,066,856	07/498,811	11/19/91
5,066,862	07/522,714	11/19/91
5,066,864	07/642,651	11/19/91
5,066,865	07/401,942	11/19/91
5,066,878	07/628,138	11/19/91
5,066,879	07/515,951	11/19/91
5,066,881	07/555,621	11/19/91
5,066,882	07/637,721	11/19/91
5,066,891	07/459,867	11/19/91
5,066,892	07/678,571	11/19/91
5,066,910	07/629,030	11/19/91
5,066,911	07/335,141	11/19/91
5,066,912	07/549,894	11/19/91
5,066,914	07/498,731	11/19/91
5,066,916	07/463,204	11/19/91
5,066,924	07/659,889	11/19/91
5,066,928	07/517,941	11/19/91
5,066,929	07/636,669	11/19/91
5,066,937	07/557,626	11/19/91
5,066,939	07/416,852	11/19/91
5,066,947	07/302,625	11/19/91
5,066,952	07/412,248	11/19/91
5,066,954	07/504,473	11/19/91
5,066,956	07/441,801	11/19/91
5,066,959	07/443,955	11/19/91
5,066,966	07/497,351	11/19/91
5,066,972	07/630,509	11/19/91
5,066,973	07/614,235	11/19/91
5,066,974	07/615,804	11/19/91
5,066,977	07/567,078	11/19/91
5,066,980	07/478,007	11/19/91
5,066,985	07/497,208	11/19/91
5,066,989	07/578,279	11/19/91
5,067,003	07/584,910	11/19/91
5,067,011	07/545,329	11/19/91
5,067,012	07/500,287	11/19/91
5,067,015	07/539,814	11/19/91
5,067,017	07/479,340	11/19/91
5,067,018	07/531,745	11/19/91
5,067,035	07/314,063	11/19/91
5,067,038	07/548,628	11/19/91
5,067,044	07/483,137	11/19/91
5,067,046	07/351,235	11/19/91
5,067,049	07/478,952	11/19/91
5,067,055	07/538,824	11/19/91
5,067,058	07/501,280	11/19/91
5,067,060	07/334,098	11/19/91
5,067,063	07/609,809	11/19/91
5,067,065	07/607,420	11/19/91
5,067,086	07/397,460	11/19/91
5,067,087	07/415,235	11/19/91
5,067,094	07/552,330	11/19/91
5,067,120	07/334,562	11/19/91
5,067,135	07/519,130	11/19/91
5,067,142	07/641,787	11/19/91
5,067,145	07/494,478	11/19/91
5,067,152	07/494,658	11/19/91
5,067,167	07/595,233	11/19/91

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

D. 340,589, Re. S.N. 08/548,218, Oct. 25, 1995, Cl. D06/366, TASK CHAIR, Zooey C. Chu, Owner of Record: *Steel-*

case, Inc., Grand Rapids, Mich., Attorney or Agent: Daniel L. Girdwood, Ex. Gp.: 2903

4,376,038, Re. S.N. 08/547,136, Oct. 24, 1995, Cl. 208/113, USE OF NAPHITA AS RISER DILUEN IN CARBO-METALLIC OIL CONVERSION, George D. Myers, Owner of Record: *Ashland Oil, Inc., Ashland, N.Y.,* Attorney or Agent: Louis Gubinsky, Ex. Gp.: 1106

4,834,750, Re. S.N. 08/538,757, Oct. 3, 1995, Cl. 623/6, DEFORMABLE-ELASTIC INTROCULAR LENS, Amitava Gupta, Owner of Record: *Amo Puerto Rico, Inc., Anasco, Puerto Rico,* Attorney or Agent: Frank J. Uxa, Ex. Gp.: 3308

4,956,302, Re. S.N. 08/561,215, Nov. 21, 1995, Cl. 435, LATERAL FLOW CHROMATOGRAPHIC BINDING ASSAY DEVICE, Julian Gordon, et. al., Owner of Record: *Abbott Laboratories, Chicago, Ill.,* Attorney or Agent: Gregory W. Steele, Ex. Gp.: 1802

5,167,721, Re. S.N. 08/558,342, Nov. 11, 1995, Cl. 134, LIQUID JET REMOVAL OF PLASMA SPRAYED AND SINTERED, Charles C. McComas, Owner of Record: *Waterjet Systems, Inc., Huntsville, Ala.,* Attorney or Agent: Jodi-Ann Mclane, Ex. Gp.: 1313

5,169,037, Re. S.N. 08/552,816, Nov. 3, 1995, Cl. 222/402.1, PRODUCT BAG FOR DISPENSING AND METHOD FOR PRODUCING THE SAME, Robert J. Davies, Owner of Record: *CCL Industries, Inc., Markham, Canada,* Attorney or Agent: Frank Pietrantonio, Ex. Gp.: 3104

5,189,049, Re. S.N. 08/526,079, Sept. 11, 1995, Cl. 514/371, HETEROCYCLIC SUBSTITUTED ACYLAMINOTHIAZOLES, THEIR PREPARATION, Daniel Frehel, et. al., Owner of Record: *Elf Sanofi, Paris, France,* Attorney or Agent: William E. Player, Ex. Gp.: 1205

5,255,890, Re. S.N. 08/548,201, Oct. 25, 1995, Cl. 251/1.3, RAM TYPE BLOWOUT PREVENTER, Charles D. Morrill, Owner of Record: *Hydril Co., Houston, Tex.,* Attorney or Agent: Frank S. Vaden III, Ex. Gp.: 3407

5,268,613, Re. S.N. 08/545,934, Oct. 20, 1995, Cl. 313/113, INCANDESCENT ILLUMINATION SYSTEM, David W. Cunningham, Owner of Record: *Gregory Esakoff, Huntington Beach, Calif.,* Attorney or Agent: Jame R. Brueggemann, Ex. Gp.: 2215

5,282,003, Re. S.N. 08/560,475, Nov. 17, 1995, Cl. 355/260, COPIER AND PRINTER TONER HOPPER SEALING DEVICE, Steven B. Michlin, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 2105

5,293,229, Re. S.N. 08/538,101, Oct. 2, 1995, Cl. 358/136, APPARATUS AND METHOD FOR PROCESSING GROUPS OF FIELDS IN A VIDEO DATA COMPRESSION SYSTEM, Siu-Leong Iu, Owner of Record: *Matsushita Electric Corp. of America, Secqucus, N.J.,* Attorney or Agent: Kenneth N. Nixon, Ex. Gp.: 2615

5,370,429, Re. S.N. 08/547,946, Oct. 25, 1995, Cl. 128/839, IUD INSERTING APPARATUS, Juan Diaz, et. al., Owner of Record: *DB Inserters, Inc., North Tonawanda, N.Y.,* Attorney or Agent: Gregory S. Gewirtz, Ex. Gp.: 3301

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

5,138,028, Reexam. No. 90/004,069, Nov. 3, 1995, Cl. 528/353, POLYMIDES END-CAPPED WITH DIARYL SUBSTITUTED ACETYLENE, Charles W. Paul, et. al., Owner of Record: *National Starch and Chemical Investment Holding Corp., Wilmington, Del.,* Attorney or Agent: Edwin M. Szala, National Starch and Chemical Corp., Bridgewater, N.J., Ex. Gp.: 1207, Requester: NASA Langley Research Center, c/o George F. Helfrich, Hampton, Va.

Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

Robert L. Boggio dba Predator Manic Systems, Newport Beach, Calif., Reg. No. 1,674,965, for the mark "PREDATOR (STYLIZED)", Can. No. 23,962.

International Set Inc., Los Angeles, Calif., Reg. No. 1,151,768 for the mark "COLLEGE", Canc. No. 23,516.

Len Poliandro International, Inc., New York, N.Y., Reg. No. 1,114,147 for the mark "VIVACE", Canc. No. 23,642.

Amcrest Corporation, New York, N.Y., Reg. No. 646,548 for the mark "CRANBROOK", Canc. No. 24,074.

Good Furniture Company Store No. 3, Inc., aka Good Furniture Company, Chicago, Ill., Reg. No. 1,223,745 for the mark "GOOD FURNITURE COMPANY AND DESIGN", Canc. No. 23,974.

JEAN BROWN
Technical Support Manager,
Trademark Trial
and Appeal Board, for
ROBERT M. ANDERSON
Deputy Assistant Commissioner
for Trademarks

Registration To Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office who have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before March 15, 1996.

Griffin, Ronald W., 6314 Farmdale Ln., Austin, Tex. 78749
Huntley, David M., 9678 Poindexter Ct., Burke, Va. 22015

January 2, 1996 KAREN L. BOVARD, *Director*
Office of Enrollment and Discipline

Registration To Practice

The following person successfully passed the registration examination that was held November 2, 1994, and has been

given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until applicant's registration certificate is mailed to applicant. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before March 15, 1996.

Ferri, Yildiz R., 29 Garden St., #409, Cambridge, Mass. 02138

January 2, 1996 KAREN L. BOVARD, *Director*
Office of Enrollment and Discipline

Patent Term Extended Under 35 U.S.C. § 156

An interim extension of the term of U.S. Patent No. 4,048,306 has been granted under 35 UC. § 156(e)(2) for a period of one year from the first extended expiration date of the patent. The patent was previously extended for one year under 35 U.S.C. §156(d)(5). See 1167 OG 14, October 4, 1994. An application for patent term extension was filed by Eli Lilly and Company, on behalf of the patent owner Boehringer Ingelheim GmbH, based on approval of the product "DYNABAC" by the Food and Drug Administration.

Errata

"All reference to Patent No. 4,792,701 to Peter J. Sacchetti of Framingham, Mass. for MOTION DETECTING LIGHT CONTROLLER SYSTEM appearing in the *Official Gazette* of February 12, 1991 should be deleted since no patent was granted."

Certificate of Correction
For Week of January 30, 1996

P. 09,323	5,341,092	5,405,580	5,435,455
Re. 34,651	5,342,243	5,409,896	5,435,680
Re. 34,706	5,344,687	5,410,623	5,435,960
Re. 34,870	5,351,669	5,411,636	5,436,501
4,776,633	5,352,857	5,411,810	5,437,519
5,108,989	5,359,819	5,412,108	5,437,631
5,116,878	5,360,529	5,413,004	5,438,027
5,125,904	5,364,979	5,413,767	5,438,442
5,176,267	5,371,228	5,414,702	5,438,747
5,205,872	5,372,410	5,415,770	5,439,412
5,209,924	5,372,797	5,416,097	5,439,669
5,252,601	5,374,548	5,419,240	5,440,011
5,254,719	5,377,463	5,420,026	5,440,492
5,262,401	5,378,280	5,420,814	5,440,756
5,263,708	5,378,541	5,423,408	5,440,842
5,270,068	5,378,716	5,424,425	5,442,104
5,281,816	5,378,747	5,424,810	5,442,476
5,290,583	5,380,331	5,425,603	5,442,569
5,291,342	5,380,489	5,425,844	5,442,609
5,291,520	5,380,740	5,426,088	5,443,093
5,292,754	5,384,203	5,427,159	5,443,558
5,296,766	5,385,285	5,429,248	5,443,778
5,299,181	5,386,917	5,429,345	5,444,468
5,308,652	5,387,606	5,429,513	5,444,506
5,311,768	5,393,672	5,431,196	5,444,667
5,314,503	5,393,746	5,432,203	5,444,738
5,320,100	5,395,591	5,432,316	5,444,753
5,328,959	5,399,586	5,434,227	5,444,805
5,331,082	5,399,751	5,434,412	5,445,147
5,332,623	5,402,321	5,434,886	5,445,563
5,338,514	5,405,218	5,435,374	5,445,876
5,445,978	5,451,431	5,455,162	5,460,535
5,446,082	5,451,438	5,455,219	5,460,828
5,446,435	5,451,472	5,456,516	5,461,069
5,447,106	5,451,626	5,456,787	5,461,108
5,447,203	5,451,850	5,456,883	5,461,776
5,447,206	5,452,056	5,457,141	5,462,050
5,447,733	5,452,277	5,457,402	5,462,234
5,447,870	5,452,372	5,457,641	5,462,668
5,448,854	5,452,471	5,457,982	5,462,737
5,448,933	5,452,605	5,457,999	5,462,823
5,449,421	5,452,611	5,458,322	5,463,079
5,449,729	5,452,986	5,459,049	5,463,447
5,449,853	5,453,136	5,459,138	5,463,478
5,450,121	5,453,273	5,459,249	5,463,610
5,450,180	5,453,563	5,459,718	5,463,856
5,450,482	5,453,678	5,459,720	5,464,134
5,450,491	5,454,432	5,459,972	5,464,599
5,450,568	5,454,549	5,459,981	5,465,122
5,450,803	5,454,967	5,460,274	5,466,717
5,451,251	5,455,083	5,460,504	5,472,310
5,451,331			

Extension of Time for filing Notices of Opposition to Marks Published in the Official Gazette Dated January 9, 1996

Since copies of the Trademark Official Gazette dated January 9, 1996, were not mailed until January 16, 1996, the thirty-day opposition period for marks published in the Trademark Official Gazette dated January 9, 1996, is extended from February 8, 1996, until February 15, 1996.

Jan. 22, 1996
Date

Robert M. Anderson
Deputy Assistant Commissioner
for Trademarks

Summary of Final Decisions

Issued by the

Trademark Trial and Appeal Board

October 23-27, 1995

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
10-25	EX	74/275,685	John W. Kline and Timothy J. Brody	2(e)(4) [surname]	Refusal Affirmed		"HOBLACHER" [beer and ale]		No
10-26	OPP	83,056	Kallista, Inc. v. Niagara Conservation Corp.	2(d); whether matter asserted for registration has been used only as a trade name	Opposition Dismissed	"NIAGARA" [bath and basin spouts]	"NIAGARA PRODUCTS" [showerheads, toilet dams and sink aerators]		No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (R)=REQ. FOR RECONSIDERATION

SPECIAL BOXES FOR PATENT MAIL

Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each special box are addressed to that box, they will be significantly delayed in reaching the appropriate area for which they are intended.

Please address mail as follows:

Box _____
Assistant Commissioner for Patents
Washington, D.C. 20231

Box Designations	Explanation
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 12	Contributions to the Examiner Education Program.
Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or material related to the Disclosure Document Program.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62).
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All communications following the receipt of a PTOL–85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box M Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee-Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent application and associated papers and fees.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filings of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

SPECIAL BOXES FOR TRADEMARK MAIL

Special box designations should be used to allow forwarding of particular types of trademark mail to the appropriate areas as quickly as possible. In addition to these box designations, filers are encouraged to indicate whether the contents of the envelope contain a fee. Envelopes containing a fee should be marked "FEE;" envelopes not containing a fee should be marked "NO FEE." Box designations and "FEE/NO FEE" indicators should appear on the envelope as well as on the cover sheet or first page of any document.

Please address mail as follows:

Box _____
FEE (or "NO FEE")
Assistant Commissioner for Trademarks
2900 Crystal Drive
Arlington, Virginia 22202-3513

Box Designations	Explanation
Box NEW APP FEE	New trademark applications and fees.
Box ITU FEE	Statements of Use (SOU's), and extension requests.
Box TTAB FEE	Oppositions, Cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections, and amendments.
Box RESPONSES NO FEE	Responses to Examining Attorneys' Office actions and Post Registration actions.

SPECIAL BOXES APPLICABLE TO *BOTH* PATENT AND TRADEMARK MAIL

The following special box designations are applicable to both patent and trademark related mail, and the recommendations for "Special Boxes for Patent Mail" (above) should be followed for the types of mail listed below.
Please address mail as follows:

Box _____
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box Designations	Explanation
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation*; papers relating to pending litigation shall be mailed only to the Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box OED	Mail for the Office of Enrollment and Discipline.

Extension of Time for filing Notices of Opposition to Marks Published in the Official Gazette Dated January 16, 1996

Since copies of the Trademark Official Gazette dated January 16, 1996, were not mailed until January 19, 1996, the thirty-day opposition period for marks published in the Trademark Official Gazette dated January 16, 1996, is extended from February 15, 1996, until February 20, 1996.

Jan. 22, 1996
Date

Robert M. Anderson
Deputy Assistant Commissioner
for Trademarks

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information in various formats from the U.S. Patent and Trademark Office. Many PTDLs have on file all full-text patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs have both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office*. The full-text utility and design patents are distributed numerically on 16 mm microfilm, and plant patents on color microfiche. Patent and trademark search systems on CD-ROM (Compact Disc-Read Only) format are available at all PTDLs to increase utilization of and enhance access to the information found in patents and trademarks. It is through the CD-ROM systems that preliminary patent and trademark searches can be conducted through the numerically arranged collections.

All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3620
Alaska	Anchorage: Z.J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4488
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6249
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette Siegesmund Engineering Library, Purdue University	(317) 494-2872
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 689-3155
Kentucky	Louisville Free Public Library	(502) 574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maine	Orono: Raymond H. Fogler Library, University of Maine	(207) 581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Library, University of Michigan	(313) 764-5298
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit: Great Lakes Patent and Trademark Center	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	(601) 359-1036
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
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Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries—(continued)

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	New York Public Library (The Research Libraries)	(212) 930-0917
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North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Akron: Summit County Public Library	Not Yet Operational
	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	Not Yet Operational
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaquez General Library, University of Puerto Rico	Not Yet Operational
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(803) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-6822
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510
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	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT EXAMINING CORPS

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LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
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J.O. THOMAS, JR., Deputy Assistant Commissioner for Patent Process Services

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN E. KITTLE, Director	308-0661	06/30/94
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director	308-1235	06/30/94
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—BARRY S. RICHMAN, Director	308-0651	08/28/94
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director	308-2351	09/29/94
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	04/15/94
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	02/14/94
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	06/28/94
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—BOBBY R. GRAY, Director	305-9600	07/07/93
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3800	04/02/94
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	06/21/94
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600—NICHOLAS P. GODICI, Director	305-4700	05/17/94
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	308-0661	06/27/94
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—F.R. SCHMIDT, Director	308-1113	05/14/94
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—CARLTON R. CROYLE, Director	308-1148	08/09/94
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	10/24/94
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	09/22/94
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-1021	07/05/94

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of November 1, 1995

Law Office	Oldest Date New*	Oldest Date Amendment Filed
Law Office 101—Ron Sussman, Acting Managing Attorney, (703) 308–9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	04/06/95	09/11/95
Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308–9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/30/95	07/28/95
Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308–9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/05/95	09/25/95
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/04/95	07/25/95
Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/01/95	06/01/95
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/02/95	06/30/95
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/16/95	08/08/95
Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions– Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/16/95	08/02/95
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/30/95	09/05/95
**Collective Marks—Class 200 **Certification Marks—Classes A & B		
Office of Trademark Services—John Walker, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	03/06/95	—0—
Renewals (All Classes)	08/18/95	—0—
Section 12(c) Publications (All Classes)	04/19/95	—0—

1. ** Assigned to all Law Office

2. Applicants with inquires concerning the status of their applications and a touch tone phone should call (703) 305–8747 through (703) 305-9752 from 6:30 a.m. to Midnight EST, Monday thru Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquires concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

REEXAMINATIONS

JANUARY 30, 1996

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,522,807 (2787th)

SUBSTANTIVE TOPICAL COMPOSITIONS

Carl Kaplan, Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.

Reexamination Request No. 90/003,824, May 9, 1995.

Reexamination Certificate for Patent 4,522,807, issued Jun. 11, 1985, Ser. No. 496,032, May 19, 1983.

Continuation-in-part of Ser. No. 342,304, Jan. 25, 1982, abandoned.

Int. Cl.[6] **A61K** *7/42;7/44*

U.S. Cl. 424—59

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–14** is confirmed.

1. A dermatologically compatible, highly substantive sunscreening oil-in-water emulsion composition comprising 0.1 to 5% octadecene-1/maleic anhydride copolymer having a molecular weight of 4,000 to 100,000, an effective sunscreening amount of a sunscreening agent, an oil, from 40 to 95% water and having a pH of 6 to 10.

B1 5,014,066 (2788th)

SYSTEM FOR SIMULTANEOUSLY DERIVING POSITION INFORMATION FROM A PLURALITY OF SATELLITE TRANSMISSIONS

Charles C. Counselman, III, Belmont, Mass., assignor to Western Atlas International, Inc., Houston, Tex.

Reexamination Request No. 90/003,781, Apr. 6, 1995.

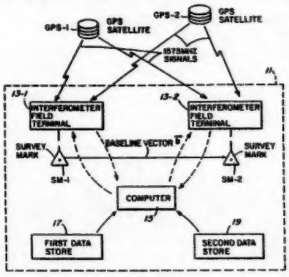
Reexamination Certificate for Patent 5,014,066, issued May 7, 1991, Ser. No. 382,291, Jul. 20, 1989.

Continuation of Ser. No. 895,148, Aug. 11, 1986, Pat. No. 4,870,422, which is a continuation of Ser. No. 353,331, Mar. 1, 1982, Pat. No. 4,667,203.

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.[6] **G01S** *5/04;* **H04B** *7/185*

U.S. Cl. 342—352



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–12** is confirmed.

1. A method of determining position information from a composite of spread spectrum, suppressed carrier signals transmitted simultaneously at the same frequencies by a plurality of orbiting satellites and received simultaneously from different directions by an antenna, comprising:

(a) forming a digital representation of said composite;

(b) applying said digital representation to a plurality of logic circuits, each said logic circuit being responsive to the signal transmitted by a different selected satellite and operating synchronously in response to a common clock;

(c) deriving simultaneously, in each said logic circuit, data representing the signal transmitted by the satellite to which each said logic circuit is responsive; and

(d) combining the simultaneously derived data from a plurality of said logic circuits to determined position information.

B1 5,137,877 (2789th)

BIFUNCTIONAL LINKING COMPOUNDS, CONJUGATES AND METHODS FOR THEIR PRODUCTION

Takeshi Kaneko, Guilford; David Willner, Hamden; Ivo Monkovic, Durham; Robert S. Greenfield, Wallingford, and Gary R. Braslawsky, Glastonbury, all of Conn., assignors to Bristol-Myers Squibb Company, New York, N.Y.

Reexamination Request No. 90/003,521, Aug. 5, 1994.

Reexamination Certificate for Patent 5,137,877, issued Aug. 11, 1992, Ser. No. 522,996, May 14, 1990.

Int. Cl.[6] **A61K** *39/395;47/00;* **C07H** *15/252;* **C07C** *281/06*

U.S. Cl. 514—25

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **13–21** is confirmed.

Claims **2** and **10** are cancelled.

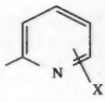
Claims **1**, **3** and **9** are determined to be patentable as amended.

Claims **4–8**, **11** and **12**, dependent on an amended claim, are determined to be patentable.

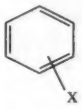
1. A bifunctional N-substituted hydrazine compound having the formula:

$$H_2NNHCONH(CH_2)_nSSR^8$$

wherein n is an integer from 1 to 10; and R^8 is



wherein X is NO_2, or halogen or



wherein X is H, NO_2 or Halogen.

B1 5,141,486 (2790th)

WASHING CELLS

Glen D. Antwiler, Lakewood, Colo., assignor to Cobe Laboratories, Inc., Lakewood, Colo.

Reexamination Request No. 90/003,656, Dec. 7, 1994.

Reexamination Certificate for Patent 5,141,486, issued Aug. 25, 1992, Ser. No. 609,748, Nov. 5, 1990.

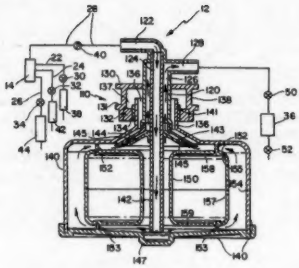
Int. Cl.[6] **B01D** *43/00*

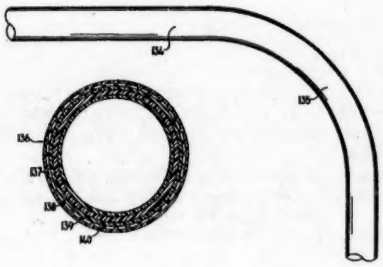
U.S. Cl. 494—37

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **2**, **4**, **5**, **6** and **9** are determined to be patentable as amended.

Claims **3**, **7** and **8**, dependent on an amended claim, are determined to be patentable.





New claims **10–27** are added and determined to be patentable.

1. The method of removing impurities from red blood cells which comprises:

providing a batch of blood containing said impurities to a centrifuge,

centrifuging *said batch of* blood containing said impurities *within said centrifuge* to form a red blood cell layer also containing said impurities, *wherein said centrifuging step comprises exposing said blood to centrifugal forces,*

stopping said centrifuging *step, wherein said red blood cell layer is free from exposure to centrifugal forces,*

mixing red blood cells from said *red blood cell* layer with a wash solution during said stopping *step to form a resultant mixture, said wash solution being for removing at least a portion of said impurities from said red blood cells,* and

centrifuging **[**the**]** *said* resultant mixture to remove said wash solution *from said red blood cell layer.*

B1 5,297,896 (2791th)

ENVIRONMENTALLY SAFE UNDERGROUND PIPING SYSTEM

Michael C. Webb, Chester Springs, Pa., assignor to Environ Products, Inc., Lionville, Pa.

Reexamination Request No. 90/003,767, Mar. 24, 1995.

Reexamination Certificate for Patent 5,297,896, issued Mar. 29, 1994, Ser. No. 857,361, Mar. 25, 1992.

Continuation-in-part of Ser. No. 838,615, Feb. 19, 1992, abandoned.

Int. Cl.[6] **F16L** *1/00*

U.S. Cl. 405—52

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–29**, and **31** is confirmed.

Claims **30** and **32** are cancelled.

New claims **33–47** are added and determined to be patentable.

33. A secondarily contained underground piping system for connecting the elements of the system including a dispensing pipe of an underground storage tank to an above ground dispensing unit, comprising:

at least one chamber installed around at least one of the elements of the system; and

flexible coaxial piping connecting the elements, said flexible coaxial piping consisting of an inner flexible primary pipe and a separate flexible damage protection and standoff pipe for secondary containment, each of said primary pipe and standoff pipe having an inner and an outer surface respectively, and

a multitude of separator legs extending radially inward from the inner surface of said standoff pipe and contacting the outer surface of the primary pipe, said separator legs creating an interstitial space for fluid migration in all directions between the primary and standoff pipes;

said primary pipe comprising a plurality of layers including an inner barrier layer and an outer protection layer.

REISSUES

JANUARY 30, 1996

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,149

RAILLESS REFRIGERATOR DISPLAY DOOR

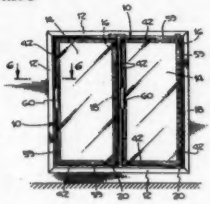
Richard J. Richardson, Simi Valley, and Bennie R. Downing, Thousand Oaks, both of Calif., assignors to Anthony's Manufacturing Company, Inc., San Fernando, Calif.

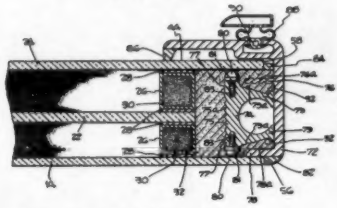
Original No. 5,113,628, dated May 19, 1992, Ser. No. 644,072, Jan. 18, 1991. Continuation-in-part of Ser. No. 585,602, Sep. 20, 1990, Pat. No. 5,097,642. Application for reissue May 19, 1994, Ser. No. 246,356

The portion of the term of this patent subsequent to Mar. 24, 2009, has been disclaimed.

Int. Cl.[6] E04B *1/74*

U.S. Cl. 52—204.593 **64 Claims**





20. A swing door assembly, comprising:

first and second door panels spaced apart to provide a space therebetween, said panels have panel edges;

a structural member positioned between said panels proximate said edges;

pads between the structural member and the panels such that the structural member extends less than the entire thickness of the space between the panels;

swinging means for mounting said panels for swinging movement;

wherein said structural member in transverse cross-section has a maximum dimension, the maximum dimension being less than the distance between said panels.

Re. 35,150

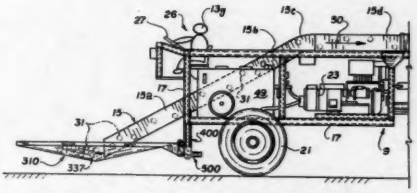
TRAY FOR FRUIT HARVESTING SYSTEM

Frank J. McKenna, Jr., Shaked Hts.; Richard K. Horst; James F. Horst, both of Orrville, all of Ohio; Charles S. Wright, Leesberg, and John D. Matthews, Melbourne, both of Fla., assignors to Kathleen McKenna, Shaker Heights, Ohio

Original No. 5,228,279, dated Jul. 20, 1993, Ser. No. 910,841, Jul. 6, 1992. Continuation-in-part of Ser. No. 802,362, Dec. 4, 1991, Pat. No. 5,152,129, which is a continuation-in-part of Ser. No. 572,152, Aug. 23, 1990, Pat. No. 5,136,635. Application for reissue Dec. 9, 1994, Ser. No. 353,520

Int. Cl.[6] A01D *46/00*

U.S. Cl. 56—328.1 **43 Claims**



30. A fruit harvesting apparatus comprising a vehicle, means to move that vehicle along the ground, a tray which is mounted to the vehicle adjacent the ground to receive picked fruit, said tray having a bottom wall which conveys the received fruit to a first end of a transfer system, means to convey the fruit from said first end of said transfer system to a second end of said transfer system, said second end of said transfer system depositing the fruit to said hopper carried by said vehicle;

wherein the hopper is connected to the vehicle adjacent the back end thereof and may be selectively elevated to facilitate removal of the fruit temporarily stored therein;

wherein the tray connects with a frame assembly to allow the tray to be selectively elevated.

Re. 35,151

MODIFIED CELLULOSE REGENERATED FIBER COMPRISING CHITOSAN PARTICLES

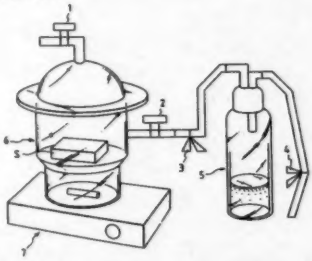
Tsuguhisa Hirukawa; Hiroaki Tanibe, both of Shizuoka, and Tuguo Miyaji, Touyo, all of, Japan, assignors to Fuji Spinning Company, Limited, Tokyo, Japan

Original No. 5,320,903, dated Jun. 14, 1994, Ser. No. 834,160, Feb. 12, 1992. Application for reissue Feb. 1, 1995, Ser. No. 382,153

Claims priority, application Japan, Feb. 20, 1991, 3-047777

Int. Cl.[6] B32B *5/16*

U.S. Cl. 428—364 **6 Claims**



1. Modified cellulose regenerated fiber containing fine particles *having a diameter less than 10 μm of a material* selected from the group consisting of particles [having a diameter less than 10 μm of a material] *of* regenerated chitosan and particles of regenerated acetylated chitosan wherein the mixing amount of said fine particles to the cellulose element of said modified cellulose regenerated fiber is at least 0.5% by weight.

PLANT PATENTS

GRANTED JANUARY 30, 1996

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,443

HYBRID TEA ROSE PLANT NAMED TWOHONOR

Jerry Twomey, Leucadia, Calif., assignor to DeVor Nurseries, Inc., Freedom, Calif.

Filed Nov. 15, 1993, Ser. No. 153,454

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of rose plant of the Hybrid Tea rose class, substantially as shown and described.

9,444

CHRYSANTHEMUM PLANT NAMED 'PINK BLUSH'

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers Inc., Barberton, Ohio

Filed Nov. 1, 1994, Ser. No. 331,863

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—74.1 **1 Claim**

1. A new and distinct Chrysanthemum plant named Pink Blush, as described and illustrated.

9,445

CHRYSANTHEMUM PLANT NAMED 'STEPHANIE'

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Dec. 30, 1994, Ser. No. 367,571

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—82.1 **1 Claim**

1. A new and distinct Chrysanthemum plant named Stephanie, as described and illustrated.

9,446

ALSTROEMERIA VARIETY NAMED 'STABOPINK'

Jacob van Andel, Aalsmer, Netherlands, assignor to Van Staaveren B.V., Aalsmeer, Netherlands

Filed Jan. 11, 1995, Ser. No. 372,435

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—87.1 **1 Claim**

1. The new variety of Alstroemeria plant substantially as herein shown and described.

9,447

ELATIOR BEGONIA PLANT NAMED TINA

Jens N. Poulsen, Gartneriet J.N.P. Larsmindevej 1, Lisbjerg, DK-8200 Aarhus N., Denmark

Filed Feb. 9, 1995, Ser. No. 388,582

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—87.18 **1 Claim**

1. A new and distinct Elatior Begonia plant named Tina, as illustrated and described.

PATENTS

GRANTED JAN. 30, 1996

ERRATA

For CLASS	See PATENT NO.
062–006	5,487,272
600–121	5,487,376
600–204	5,487,377
238–002	5,487,501
239–069	5,487,502
439–164	5,487,667
044–328	5,487,770
216–067	5,487,810
205–347	5,487,819
205–716	5,487,820
588–212	5,487,873
424–673	5,487,906
528–005	5,487,924
507–211	5,488,083
534–605	5,488,098
424–009	5,488,133
235–375	5,488,223
250–231	5,488,240
376–313	5,488,634
385–129	5,488,696

PATENTS

GRANTED JANUARY 30, 1996

GENERAL AND MECHANICAL

5,487,187

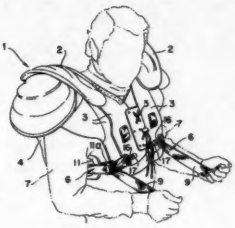
UNDERARM STRAPS FOR SHOULDER PADS

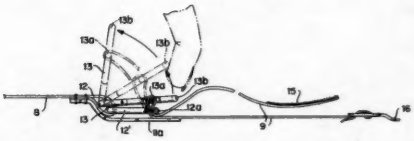
Rodney M. Zide, 7 Painters Crossing; Robert M. Zide, 300 W. Fourth St., both of Williamstown, W. Va. 26187, and James L. Rector, 1709 Forest Hills Dr., Vienna, W. Va. 26105

Filed Mar. 22, 1994, Ser. No. 210,756

Int. Cl.[6] A41D *13/00;* **A44B** *11/25*

U.S. Cl. 2—2 **25 Claims**





14. A tightening strap assembly comprising, a pair of first and second strap segments of non-elastic strap material, said first strap segment having one end adapted to be connected to a first member, said first strap segment having an other end, a pair of superimposed inner and outer clamping rings having rims being connected to said other end of said first strap segment, the second strap segment extending upwardly through both of said inner and outer clamping rings and then downwardly over the rim of said outer clamping ring and under the rim of said inner clamping ring, whereby the second strap segment is gripped between the rims of the clamping rings, one end portion of the second strap segment adapted to be connected to a second member, an other end portion of said second strap segment positioned to be grasped and moved forwardly by the user to shorten the length of and to thereby tighten the strap assembly, a first component of a fastener provided on said first strap segment substantially intermediate the ends thereof, and a second component of a fastener provided on said other end portion of said second strap segment adapted to cooperate with said first fastener component, to thereby detachably interconnect said first and second strap segments, whereby after the strap assembly is tightened said other end portion of the second strap is folded backward to cover the clamping rings and the first and second strap segments are interconnected.

5,487,188

GLOVE WITH MEANS FOR PROTECTING THE LICAMENTS AND ARTICULATIONS OF THE HAND

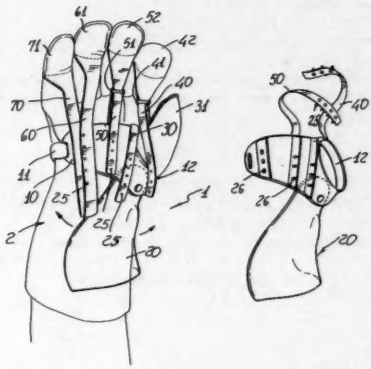
Walter Micheloni, Via Piavanini 30; Fabrizio Giugi, Via Caselle 13, both of 23100 Albosaggia (Sondrio), Italy, and Georg Ahlbaumer, Via Arona 34, 7500 St. Moritz, Switzerland

Filed Jun. 22, 1994, Ser. No. 263,512

Claims priority, application Italy, Aug. 24, 1993, MI93A1846

Int. Cl.[6] A41D *13/08*

U.S. Cl. 2—16 **10 Claims**



1. A glove with means for protecting the ligaments, articulations and bones of an user hand, said glove having glove thumb, forefinger, middle ring and small fingers and comprising a glove body, a plate for protecting the palm of the hand connected to said glove body, said plate being provided, at one end portion thereof, with an annular element encompassing a bottom region of the hand thumb, to said plate being moreover pivotally connected a forearm engaging shield, tie-straps being moreover provided for connecting said fingers of said glove with said plate, said tie-straps having each a hole through a free end portion thereof.

5,487,189

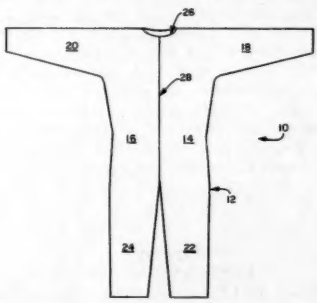
COVERALLS HAVING REDUCED SEAMS AND SEAMLESS SHOULDER CONSTRUCTION AND METHOD OF MANUFACTURE

Richard H. Bell, Tucson, Ariz., assignor to Kimberly-Clark Corporation, Neenan, Wis.

Filed Mar. 16, 1994, Ser. No. 214,871

Int. Cl.[6] A41D *1/06*

U.S. Cl. 2—79 **20 Claims**



1. Protective coveralls comprising:

a first body half and a second body half, each composed of a seamless sheet of material, said second body half being substantially a mirror image of said first body half, and each body half including:

a body portion having a first and second edge and a top edge extending approximately half-way across the body portion from the second edge;

a sleeve portion having a top and bottom sleeve edge, a top edge, and a segment of the second edge of the body portion; and

a leg portion having a front and a rear leg edge;

closure means joining the first edges of each body portion on each body half;

a seam joining the second edges of the body portion, including the segment of the second edges in the sleeve portions, on each body half;

sleeve seams joining the top sleeve edges to the bottom sleeve edges on each body half;

inseams joining the front leg edges to the back leg edges on each body half; and

back seams joining each top edge of a sleeve portion with the top edge of its respective body portion on each body half.

5,487,190

WORKMAN'S MATERIAL SUPPORT VEST FOR SUPPORTING CYLINDERS

Todd G. Thompson, 2923 North Pl., Oklahoma City, Okla. 73107

Filed Jun. 3, 1994, Ser. No. 253,997
Int. Cl.[6] A41D *1/04*
U.S. Cl. 2—102 **1 Claim**

1. A caulking tube supporting vest, comprising:

an elongated length of non-stretchable fabric having end edges and parallel sides edges and having a substantially rectangular user's head receiving opening medially the fabric length and width for forming parallel shoulder straps and front and back panels each having an outer surface and partially covering a user's torso when placed over the shoulders of a user;

releasable strap means joining the end edges of the front and back panels to each other at respective sides of a user; and,

a selected width and length of elastic fabric secured to the outer surface of each said front and back panel medially the width of the respective panel and between the respective said end edge and the head opening to form, in combination with the respective panel, a series of horizontally disposed juxtaposed open end caulking tube receiving sleeves.

5,487,191

VENTED VISOR CAP

Robert L. Ridley, 3304 Country Club La., Altoona, Wis. 54720

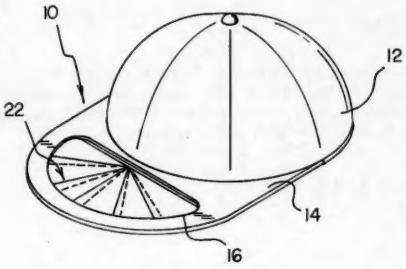
Filed Aug. 18, 1994, Ser. No. 292,384
Int. Cl.[6] A42B *1/04*
U.S. Cl. 2—195.1 **1 Claim**

1. A vented visor cap comprising:

an article of headwear;

a visor attached to said article of headwear and extending therefrom, said visor having a visor aperture extending therethrough; and,

venting means for reducing a passage of light through said visor aperture and permitting a passage of wind currents through said visor aperture, wherein said venting means comprises a plurality of inner vent webs, a plurality of medial vent webs, and a plurality of outer vent webs, each of said webs being joined to a portion of said visor proximal to said visor aperture and joined together at a center point of a trailing edge of said venting means.

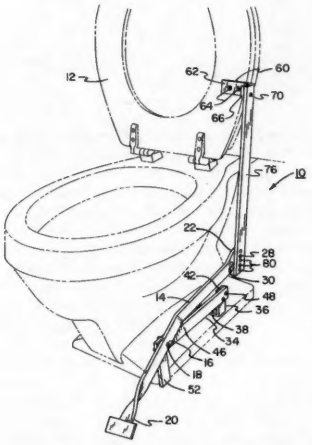


5,487,192

APPARATUS FOR THE RAISING AND SELF-LOWERING OF A TOILET SEAT

Glenn D. Hodges, Rte. 1, Box 800, Blowing Rock, N.C. 28605

Filed Nov. 23, 1994, Ser. No. 344,214
Int. Cl.[6] A47K *13/10*
U.S. Cl. 4—246.3 **3 Claims**



1. An apparatus for the raising and self-lowering of a toilet seat comprising:

a lever, the lever being disposed in an essentially vertical plane having a central aperture thereon and extending therethrough for the receipt of a bolt and an associated nut for constituting a pivot point, the lever having an outboard end with a pedal secured thereto for being depressed by the foot of a user, the lever having an inboard end with an aperture therethrough for receipt of a bolt with an associated nut for transferring motion from the pedal to a toilet seat to be lifted upon the depression of the pedal; and

a support assembly for attachment to a support bolt of a toilet bowl and for supporting the lever at its pivot point, the support assembly including an L-shaped bracket with a horizontal leg formed with an aperture for being received by and secured to the support bolt of the toilet bowl and with the L-shaped bracket having an upstanding leg with an aperture, the support assembly also having a horizontal bracket having an inboard end and an outboard end with a pair of apertures at each end, one of the pair of apertures at the inboard end being coupled to the apertures of the L-shaped bracket, the support assembly also including a vertical bracket having an upper end with two apertures adapted to be received in the outboard apertures of the horizontal bracket and with a lower end positionable in contact with the toilet for maintaining a proper orientation of the support assembly.

5,487,193

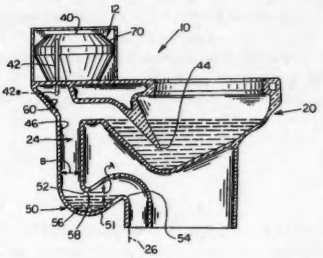
ENHANCED OPERATION TOILET

Arnold Hennessy, Wellington, Canada, assignor to Fluidmaster, Inc., Anaheim, Calif.

Continuation-in-part of Ser. No. 870,569, Apr. 17, 1992, abandoned. This application Aug. 27, 1993, Ser. No. 113,387

Int. Cl.[6] E03D *3/10*

U.S. Cl. 4—328 3 Claims



1. A vacuum assisted toilet which includes a toilet bowl, a flush conduit for passing water to said bowl, a bowl outlet which is coupled to a drain, a source of flush water and vacuum, and a flush valve, wherein said source of flush water and vacuum includes walls forming a container and a dividing device within said container which divides it into a water chamber and a vacuum chamber, said flush valve being operable to flow water from said water chamber to said toilet bowl at the beginning of a flushing, said vacuum chamber being coupled to said bowl outlet to apply a vacuum thereto, said dividing device being movable to expand and contract said water chamber and respectively contract and expand said vacuum chamber, characterized by:

a spring coupled to said container and to said dividing device and urging said dividing device to contract said water chamber and expand said vacuum chamber, to cause water in said water chamber to flow rapidly into said toilet bowl and to produce a large vacuum in said vacuum chamber and therefore in said bowl outlet.

5,487,194

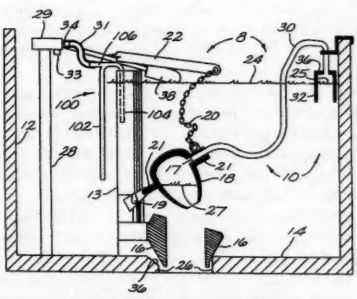
DEVICE TO RESTORE WATER LEVEL IN TOILET BOWL

Paul E. Kightlinger, 8410 E. Rolling Ridge, Tucson, Ariz. 85710

Filed Feb. 28, 1994, Ser. No. 203,227

Int. Cl.[6] E03D *1/00*

U.S. Cl. 4—415 2 Claims



1. In a toilet assembly having a water holding toilet tank and a waste collecting toilet bowl operably connected to the toilet tank to receive water from the toilet tank so that when the toilet is flushed the wastes are carried away by the water, after which the connection is closed until the next flush, an overflow pipe and a float actuated valve located interiorly to the toilet tank, the overflow pipe also operably connected to the toilet bowl to convey water to the toilet bowl and the float actuated valve operating to supply water to the toilet when water beings draining from the toilet tank, the float actuated valve also having a bleed water outlet operably connected to the overflow pipe to convey bleed water to the toilet bowl during toilet tank refilling, an improvement to restore water in the toilet bowl to an optimum pre-flush standing level, said improvement comprising:

means to convey water from the toilet tank to the toilet bowl during refilling of the toilet tank in addition to that water supplied the toilet bowl by the bleed water outlet to bring the toilet bowl water level up to the optimum pre-flush standing level, said means including an elongated hollow "U" shaped syphon tube having a first leg and a second leg with interposed rounded portion, said first leg residing in the water in the toilet tank and said second leg residing interiorly to the overflow pipe, and further including an initiator tube of two ends, one end attached to said syphon tube rounded portion and the other end connected to the float actuated valve bleed water outlet, said initiator tube having an air vent opening therein, said air vent opening oriented upwards to minimize water leakage therefrom, the bleed water passing through said initiator tube, sealing said air vent opening, and entering said syphon tube rounded portion to cause water to be syphoned from the toilet tank into the overflow tube to increase the flow of water into the toilet bowl in order to reach the optimum pre-flush standing level prior to termination of the flush and when water ceases issuing from the bleed water outlet, air enters said air vent opening into said initiator tube and into said syphon tube to terminate operation of the syphon.

5,487,195

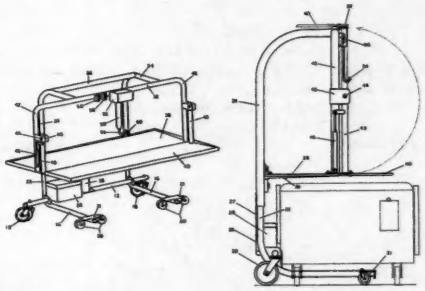
PATIENT LIFTING AND TRANSPORTING APPARATUS

Donald A. Ray, 396 Ranger La., S. Charleston, W. Va. 25309

Filed Feb. 22, 1993, Ser. No. 20,977

Int. Cl.[6] A61G *7/10*

U.S. Cl. 5—83.1 4 Claims



1. Apparatus for lifting and transporting a patient comprising

a base frame adapted to extend under a bed, said base frame having wheels for mobility,

a vertical support structure mounted along one side of said base frame, said vertical support structure including a pair of fixed support posts attached to said base frame and further including a sliding support frame having telescoping support members around said posts,

a pair of first and second patient supporting plates connected to said support structure,

adjustment means to adjust said supporting plates vertically upon said support structure,

said first supporting plate being positioned in a generally horizontal orientation and being adapted to be lowered onto the bed and slid partially under a prone patient, and

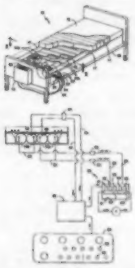
pivot means to pivot said second supporting plate between an upper inoperative position and a lower operative position contiguous to said first supporting plate.

5,487,196

AUTOMATED PRESSURE RELIEF MATTRESS SUPPORT SYSTEM

John W. Wilkinson, Bennington, Vt., and Richard W. Raburn, Simpsonville, S.C., assignors to Span America Medical Systems, Inc., Greenville, S.C.

Filed Jan. 10, 1994, Ser. No. 179,604
Int. Cl.[6] A47C *27/10*
U.S. Cl. 5—453 **18 Claims**



1. A method of supporting a bed patient on a mattress comprising the steps of:

(a) providing a mattress having a plurality of elongated flexible substantially air-impervious compartments extending longitudinally of the mattress in side-by-side relation, said compartments including right and left side elongated tube means;

(b) determining an air pressure in said compartments of the mattress which minimizes patient-to-mattress interface pressure;

(c) supporting a bed patient on the mattress in a given geographic location of use; and

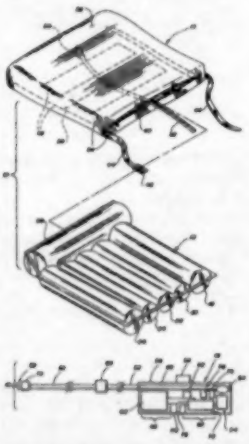
(d) uniformly pressurizing the compartments with air to said pressure which minimizes patient-to-mattress interface pressure.

5,487,197

PNEUMATIC WHEELCHAIR CUSHION

Joseph W. Iskra, Jr., 519 Dornoch, and John A. Havener, 1200 Astoria, both of St. Louis, Mo. 63137

Filed Aug. 5, 1994, Ser. No. 286,742
Int. Cl.[6] A47C *27/08;7/02;* **A61G** *7/057*
U.S. Cl. 5—654 **6 Claims**



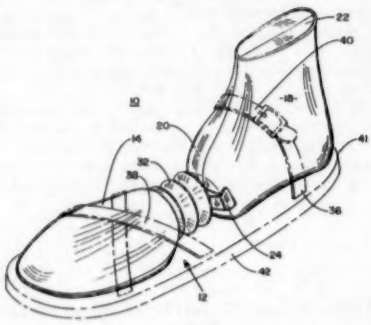
1. A generally rectangular pneumatic wheelchair cushion system comprising an air cushion with five adjoining lateral tubes, said lateral tubes comprising a right greater trochanter tube, a right ischial tuberosity tube, a coccyx tube, a left ischial tuberosity tube and a left greater trochanter tube, and one adjoining transverse tube for cushioning the user's thighs, said transverse tube comprising a femur tube, said tubes pneumatically interconnected with restricted passageways, one of which passageways interconnects the coccyx tube and the femur tube, such that pressure on one or more of the tubes is transmitted between the coccyx tube and femur tube and to the other tubes, and a control module with means for controlling an inflation pressure in the air cushion within an upper and a lower set point, said control module pneumatically connected to the air cushion, said right and left greater trochanter tubes being larger in cross-section than the right and left ischial tuberosity and coccyx tubes so that the air cushion is concave when viewed from above.

5,487,198

TWO-PIECE HIGH TOP SHOE TREE

Roger P. Mueller, Jamesville; Roy P. Mueller, Baldwinsville, both of N.Y.; Joe Nemeth, Chomedey, and Robert Schoning, Montreal, both of, Canada, assignors to RPM Industries, Inc., Auburn, N.Y.

Filed Aug. 26, 1994, Ser. No. 296,651
Int. Cl.[6] A43D *5/00*
U.S. Cl. 12—117.4 **16 Claims**



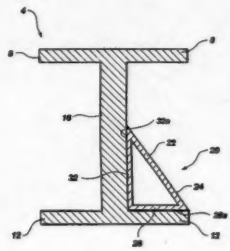
1. A high top shoe tree for use with foot wear, said shoe tree comprising:

a toe member, having approximately the shape of the front half of a human foot, having a distal tip end and a proximal end, said toe member being insertable into a toe portion of a respective piece of footwear and formed to support the toe portion of the footwear;

an L-shaped heel member having approximately the shape of the back half of a human foot, being insertable into a heel portion of the respective piece of footwear and formed to support the heel portion thereof, said heel member having a forward end and a top end and extending from said midpoint of the footwear to a back thereof when inserted therein;

quick release means for securing said toe member to said heel member whereby said toe member and said heel member may be assembled together and inserted into the respective piece of footwear to give support thereto said quick release means including a dovetail tenon formed on said proximal end of said toe member; and a mortise slot formed in said forward end of said heel member, said mortise slot being shaped to correspond to said dovetail tenon so that it is snugly slidable into said mortise slot whereby said toe member is secured to said heel member at a midpoint of the respective piece of footwear when the two members are inserted therein.

5,487,199
VANDALISM PREVENTION DEVICE FOR HIGHWAY BRIDGES
John Nelson, 1811 Tramway Dr., Sandy, Utah 84092
Filed Apr. 4, 1994, Ser. No. 222,718
Int. Cl.[6] E01D *1/00*
U.S. Cl. 14—74.5 16 Claims



1. A method for inhibiting vandalism to bridges and the like which are supported by I-beams and similar structures, the method including:

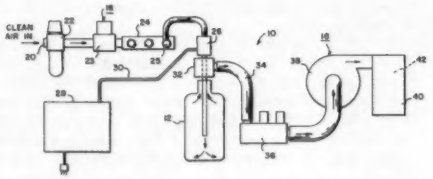
(a) positioning an elongate plate adjacent to an I-beam so that the plate slopes downwardly and outwardly from a position adjacent a central, vertical wall of the I-beam to a position adjacent a lateral extreme of a flange comprising a lower portion of the I-beam at an angle sufficiently steep to inhibit a person from standing on the elongate plate;

(b) attaching the elongate plate to the I-beam so that the elongate plate is held in position adjacent the I-beam;

wherein step (b) comprises, more specifically, attaching the elongate plate to the I-beam; and

further comprising providing a generally vertical support wall extending from an upper end of the elongate plate and extending generally parallel to the central, vertical wall of the I-beam.

5,487,200
BOTTLE CLEANER
Kenneth J. Herzog, 200 Mill Rd., Riverhead, N.Y. 11901
Filed Jan. 24, 1994, Ser. No. 185,142
Int. Cl.[6] A47L *5/38*
U.S. Cl. 15—1.51 3 Claims



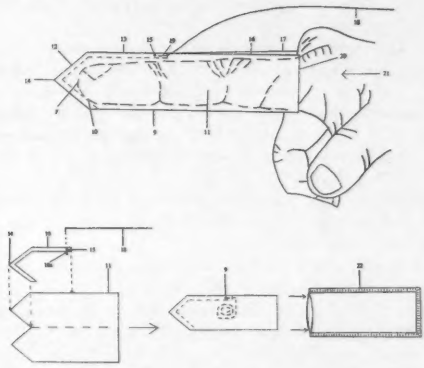
1. A container cleaner apparatus wherein containers are conveyed to stations for cleaning comprising:

a) a first means for supplying ionized air to the interior of the containers at the stations to neutralize static electricity therein;

b) a second means for vacuuming the interior of the containers at the stations, wherein dust, dirt, carton lint and other foreign matter is removed from the interior of the containers and

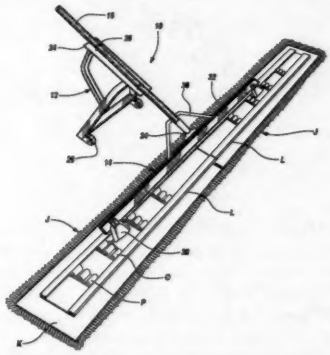
c) a third means for moving said first and second means into and out of said containers; wherein said first and second means are mounted together and function simultaneously; including a fourth means for stopping flow of ionized air when said first means is out of said container.

5,487,201
DISPOSABLE TOOTH AND GUM CLEANING DEVICE
Bryan C. Hansen, and Sharon A. Hansen, both of 198 Driftwood Trail, McHenry, Ill. 60050
Filed Aug. 13, 1993, Ser. No. 106,135
Int. Cl.[6] A46B *5/04;* B65D *81/20*
U.S. Cl. 15—104.94 19 Claims



1. An oral wipe comprising an elongated sleeve, the sleeve being formed of an interwoven material, the sleeve having a closed end defining at least one corner, the sleeve having an open end to enable a finger to be readily inserted in the sleeve, the sleeve having at least one edge therealong, a pick element formed of a heat sealable material different from said interwoven material the sleeve being heat sealed to the pick element along said at least one edge of the sleeve and at said closed end, a piece of dental floss, the piece of dental floss having one floss end embedded and retainingly secured in said heat sealable material.

5,487,202
FLOOR MOPPING DEVICE WITH WHEELED SUPPORT FRAME
Gloria L. Cowan, 2720 Wilkinson Rd., Sarasota, Fla. 34231
Filed Jan. 9, 1995, Ser. No. 370,376
Int. Cl.[6] A47L *13/258;* B62B *1/14;1/00*
U.S. Cl. 15—228 2 Claims



1. A floor mopping device for cleaning a floor, said device comprising:

a rigid main frame including:

a generally U-shaped elongated member having first and second ends with a central portion therebetween and a transverse elongated cross member extending between and

connected to said first and second ends, said members together defining a plane;

a floor engaging wheel connected at each end of said cross member and held for rotation about an axis generally parallel to said cross member by mounting forks;

an elongated diagonal member having first and second ends and connected at one end thereof to a central portion of said cross member, said diagonal member extending away from said plane;

an elongated generally flat diagonal plate connected to and extending between another end of said diagonal member and said central portion of said U-shaped member;

an elongated push handle connected to, and extending longitudinally in first and second directions from, said diagonal plate and adapted to be oriented by said diagonal plate at an acute angle to the floor;

an elongated flat support plate receiving a removable cleaning pad which is generally coextensive with a bottom surface of said support plate;

means for pivotally connecting said support plate to a lower end of said push handle;

said wheels and said support plate movably supporting said device in an upright position for use atop the floor.

5,487,203

SQUEEGEE HAVING AN ADVERTISING DISPLAY AREA

Philip L. Brach, Jr., 655 Sixth St., Hermosa Beach, Calif. 90254; Charles Khalil, 26722 Rolling Hills Rd., Rolling Hill Estates, Calif. 90274, and Robert W. Mead, 655 Sixth St., Hermosa Beach, Calif. 90254

Filed Jan. 11, 1994, Ser. No. 179,701

Int. Cl.[6] A47L *13/11*

U.S. Cl. 15—245 **14 Claims**

1. In combination, a handle having an advertising display area and a squeegee, said handle comprising an elongate member having an exterior surface, a gripping end portion at one end of said member, means for detachably connecting the squeegee to the opposite end portion of said member, the portion of the elongate member between the end portions thereof having a polygonal transverse cross-sectional configuration providing a plurality of flat faces on the exterior surface of said elongate member, and distinct advertising indicia connected to and displayed on each said flat face of the polygonal portion of the elongate member, whereby an increased advertising viewing area is provided for catching the eye of a potential customer.

5,487,204

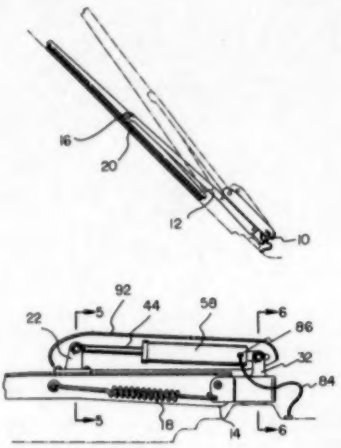
WINDSHIELD WIPER WITH DEICER

Steven M. Nelson, 717 2nd St., NW., Pipestone, Minn. 56164

Filed Nov. 28, 1994, Ser. No. 345,605

Int. Cl.[6] B60S *1/32;1/04*

U.S. Cl. 15—250.19 **2 Claims**



1. A windshield wiper assembly including a wiper deicer for eliminating build-up of snow and ice on a thereon said assembly comprising:

an elongated wiper bracket having a first end, a second end, and an intermediate extent therebetween, the first end rotatably mounted on a second support bracket, a retention spring connected to the second support bracket and the intermediate extent, of the wiper bracket a wiper blade attachment secured to the second end of the wiper bracket;

a first support bracket having an upper portion and a lower portion, the lower portion secured to the intermediate extent of the wiper bracket, the upper portion comprising a first support and a second support, the first support and the second support having aligning apertures therethrough;

said second support bracket having an upper portion and a lower portion, the lower portion of the second support bracket having a U-shaped spline thereon, the upper portion of the second support bracket having a first support and a second support, the first support and the second support of the second support bracket having aligning apertures therethrough, the second support bracket adapted to be mounted for rotation on a vehicle.;

a support rod having a first end and a second end, the first end of the support rod having an aperture formed therethrough, the first end of the support rod secured between the first support and the second support of the upper portion of the first support bracket by a first fastening means extending through the aperture of the support rod and the aligning apertures of the first support and the second support of the first support bracket;

a hollow electrical solenoid casing having an open first end and a closed second end, the open first end receiving the second end of the support rod, a wiper seal and scraper secured within the open first end adjacent the second end of the support rod, a pivot rod having a first end and a second end, the first end of the pivot rod secured to the closed second end, the second end of the pivot rod pivotally secured to the first support and the second support of the upper portion of the second support bracket by a second fastening means extending through the aligning apertures thereof and the second end of the pivot rod;

an electrical solenoid secured within the hollow electrical solenoid casing, the electrical solenoid comprising a hollow shaft,

a movable core situated within the shaft, the movable core having a first end, a second end, and an intermediate extent therebetween, the first end of the core secured to the second end of the support rod, a coil electrically secured to the shaft, a wire having a first end and a second end, the first end of the wire electrically secured to the charged coil, the second end of the wire extending outwardly of the solenoid casing;

a push button mechanism adapted to be secured on an inside portion of the vehicle thereby being accessible to a driver, the push button mechanism electrically secured to the second end of the wire of the electrical solenoid;

a protective cover removably secured to the first support bracket and the second support bracket, the protective cover functioning to protect the electrical solenoid.

5,487,205

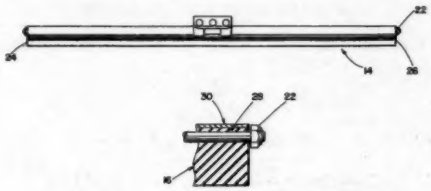
WINDSHIELD WIPER BLADE WITH SECURING ROD

Richard P. Scherch, and Robert E. Neer, both of Urbana, Ohio, assignors to Grimes Aerospace Company, Columbus, Ohio

Continuation of Ser. No. 992,588, Dec. 18, 1992, abandoned. This application May 4, 1994, Ser. No. 238,146

Int. Cl.[6] B60S *1/38*

U.S. Cl. 15—250.31 **1 Claim**



1. A wiper assembly, comprising:

an elongated one-piece rubber wiping element having an insert portion defining a first longitudinal edge of said wiping element, and a windshield contact portion defining a second longitudinal edge of said wiping element, said insert portion of a substantially higher durometer rubber than said windshield contact portion thereby enabling said windshield contact portion to remain flexible to adapt to the contour of a windshield surface while said insert portion is relatively rigid, said wiping element having first and second ends;

an elongated metal rod forming a spine, said rod residing within a hollow portion of said insert portion that rims longitudinally and entirely through said insert portion of said wiping element, said rod having first and second threaded ends extending respectively from said first and second ends of said wiping element;

an elongated holder, said holder forming a longitudinal channel therein which slidably receives, in a longitudinal manner, and encloses the entire length of said insert portion having said rod therein;

a first threaded fastener engaging said first end of said rod; and

a second threaded fastener engaging said second end of said rod, wherein said first and second fasteners secure and insert portion within said holder to prevent said wiping element from being detached longitudinally from said holder.

5,487,206

DOOR CONTROL DEVICE

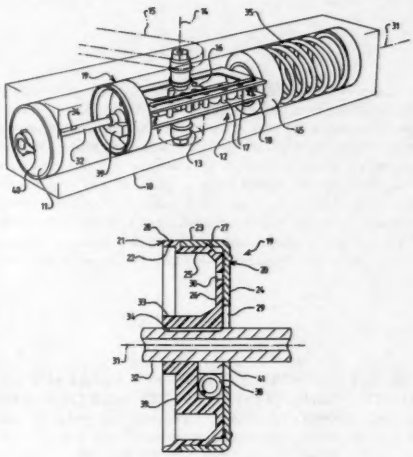
Peter E. Brown, and Stephen J. Harrison, both of Bridgnorth, England, assignors to Jerbron Limited, Wes Midlands, United Kingdom

Filed Jan. 16, 1994, Ser. No. 177,917

Claims priority, application United Kingdom, Jan. 8, 1993, 9300288

Int. Cl.[6] E05F *3/10*

U.S. Cl. 16—52 **10 Claims**



1. A door control device comprising a hollow housing defining a chamber and a piston disposed in the chamber and capable of reciprocal movement relative to the housing along a rectilinear path, the door control device further comprising an elongate flow control element which extends into the piston, the piston having a face which is transverse to said path, said face having an aperture spaced from the housing, the piston comprising a seal with a radially outer portion which engages the housing in sliding contact therewith to seal the interface between the piston and the housing and a radially inner portion which slidably engages the elongated flow control element and wherein the seal also includes a relatively flexible intermediate portion overlapping said face of the piston, which intermediate portion seals the aperture in the piston when the piston is subjected to hydraulic pressure acting in a first direction along the path of travel of the piston and wherein the face of the piston provides a seat for said flexible portion of the seal and said flexible portion can flex away from the seat when subjected to hydraulic pressure acting in a second direction along said path.

5,487,207

HINGE ELEMENT FOR A FOLDING SUPPORT

Henri Rey, 8 rue des Augustins, Colmar, France

PCT No. PCT/FR87/00304, § 371 Date Mar. 6, 1989, § 102(e) Date Mar. 6, 1989, PCT Pub. No. WO88/01676, PCT Pub. Date Mar. 10, 1988

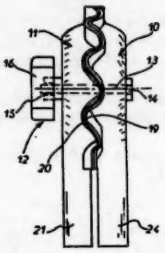
PCT Filed Aug. 4, 1987, Ser. No. 348,670

Claims priority, application France, Sep. 5, 1986, 86 12584

Int. Cl.[6] E05D *11/10*

U.S. Cl. 16—330 **9 Claims**

1. A hinge element for a folding support provided with longitudinal uprights and cross pieces, comprising two identical metallic shells each having a shaped tip adapted to be fixed at one end of-an upright of the support, a circular part made of a dished metal plate provided with a bottom positioned transversely with respect to the axis of the hinge, a wall extending generally transversely from said bottom, and a peripheral flange having an anchoring member for interengaging with the anchoring member of the other shell to



render the two shells fixed with respect to rotation around said axis, the hinge element comprising in addition locking members arranged to press the two shells axially against one another in a manner so as to maintain their anchoring members in mutual engagement, wherein each of said flanges extends substantially radially with respect to the hinge axis, each said flange extends from said wall of said dished metal plate, the metal plate of each said flange has a corrugated profile in the circumferential direction, and the corrugated profile comprises rounded crests and rounded hollows, the crests having substantially the same profile as the hollows.

5,487,208

DEVICE FOR THE DETECTION OF BREAKAGE OF TEXTILE FIBER SLIVERS BEFORE A DRAW FRAME

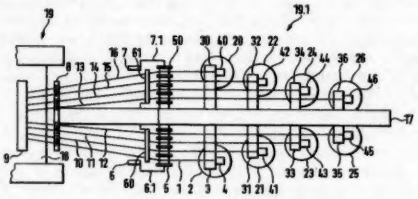
Friedrich Hauner, Ingolstadt, Germany, assignor to Rieter Ingolstadt Spinnereimaschinenbau AG, Ingolstadt, Germany

Filed Dec. 9, 1993, Ser. No. 164,348

Claims priority, application Germany, Dec. 23, 1992, 42 43 847.0

Int. Cl.[6] D01G *31/00*

U.S. Cl. 19—0.25 **20 Claims**



1. A device for detecting breakage of fiber slivers delivered to a draw frame in a running direction along a running path by a feeding device, said device comprising a monitoring device defining a monitoring section defined below the running path of fiber slivers to said draw frame, said device further comprising a deflection device disposed so as to contact and deflect the fiber slivers from a straight path in their running path to said draw frame towards said monitoring section, said deflection device imparting a pre-stress to said fiber slivers so that when any individual fiber sliver breaks said pre-stress condition ensures that said broken sliver falls through said monitoring section.

5,487,209

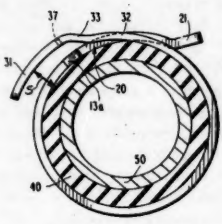
SELF-TIGHTENING CLAMP STRUCTURE

Hans Oetiker, Horgen, Switzerland, assignor to Hans Oetiker AG Maschinen- und Apparatefabrik, Horgen, Switzerland

Filed Dec. 9, 1993, Ser. No. 163,546

Int. Cl.[6] F16L *33/02*

U.S. Cl. 24—20 R **30 Claims**



1. A self-tightening clamp structure having a first released position in which the clamp structure exerts a clamping action and a second position in which the clamp structure is adapted to be latchingly held against the inherent tightening forces, comprising clamping band means including a tongue-like extension at one end thereof having a bent-up end portion, a first slot-like opening in said clamping band means through which said tongue-like extension is adapted to slide, latching means in the other end area of said clamping band means for holding said clamp structure in the second position, and further means in the end areas of the clamping band means to enable release of said tongue-like extension from said second position into said first clamping position with positive tool guidance of the tongue-like extension in the circumferential direction to prevent sparking during release of the clamp structure from said second position, said further means including tool-engaging surface means extending in a plane transverse to the plane of the clamping band means.

5,487,210

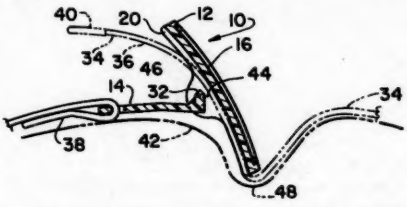
BUCKLE FACEPLATE BELT CLAMP

Howard Silagy, 100A Tec St., Hicksville, N.Y. 11801

Filed Oct. 13, 1994, Ser. No. 322,286

Int. Cl.[6] A44B *11/00*

U.S. Cl. 24—170 **1 Claim**



1. A method of fitting a belt in encircling relation about a user's waist with a buckle of a type having an external and underside surfaced faceplate and a pivotally traversable clamp having opposite proximal and distal ends, said method comprising the steps of fabricating said faceplate with spaced apart pivot trunnions at a medial location thereon and in depending relation to said underside surface, fabricating said clamp in a planar configuration at said proximal end and with a belt-engaging laterally extending projection at said distal end, mounting said clamp in spanning relation between said pivot trunnions to partake of pivotal movement beneath said faceplate underside surface, attaching a first of opposite ends of a belt to said clamp proximal end, positioning said clamp with said attached belt in an interposed condition with said planar proximal end flat on one side against said overlying faceplate and flat on an opposite side against said user's waist such that said contact with said user's waist holds said clamp stationary, extending from said clamp-attached belt a remaining belt length portion in encircling relation in a counterclockwise direction about said user's waist, urging in opening movement said faceplate from an adjacent-clamp position into a clearance position therefrom to form a nip between said faceplate underside surface and said beltengaging projection of said clamp, said nip having a size corresponding to the extent of pivotal movement permitted by the projection of an opposite portion of said faceplate into said user's

waist, inserting an unattached said second belt end in said nip between said clamp belt-engaging projection and said faceplate underside surface, pulling in a counterclockwise direction said belt so as to form a closed loop thereof sized to preliminarily fit about said user's waist, and conjointly urging in closing movement said faceplate from said clearance position back to said adjacent-clamp position so as to simultaneously urge said belt in said nip in additive counterclockwise movement to thereby form a tighter closed loop about said user's waist, whereby said belt is held against clockwise movement in said nip between said stationary clamp and said overlying faceplate closed upon said belt.

5,487,211

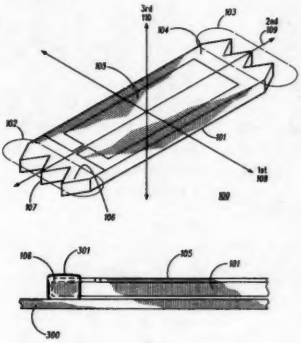
METHOD FOR FABRICATING A SURFACE-MOUNTABLE CRYSTAL RESONATOR

Kevin L. Haas, Hoffman Estates; Ken A. Haas, Hanover Park, and Kimber J. Vought, Wauconda, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 19, 1993, Ser. No. 109,222

Int. Cl.[6] H01L *41/04;* **H03H** *3/02;* **H04R** *17/10*

U.S. Cl. 29—25.35 **4 Claims**



1. A method for fabricating a surface-mountable crystal resonator, the method comprising the steps of:

a) forming a piezoelectric crystal substrate to have a first major surface, a second major surface, and a first attachment area, wherein the first major surface and second major surface are substantially co-planar separated by thickness of the piezoelectric crystal substrate and are parallel to a first major axis and a second major axis and perpendicular to a third major axis, wherein the first major axis, the second major axis, and the third major axis are substantially perpendicular to each other, and wherein the first attachment area is substantially parallel to the first major axis and includes at least two extensions, each of the at least two extensions comprising a first extension surface and a second extension surface, wherein the first extension surface is planar and substantially at 45 degree angles with respect to the first major axis and the second major axis and substantially parallel with respect to the third major axis, and wherein the second extension surface is planar and substantially at 45 degree angles with respect to the first major axis and the second major axis and substantially parallel with respect to the third major axis, and wherein the first extension surface and the second extension surface are substantially perpendicular;

b) forming, on the first major surface, a first predetermined electrode pattern;

c) forming, on the second major surface, a second predetermined electrode pattern, wherein the first predetermined electrode pattern and the second predetermined electrode pattern form an active area of resonance; and

d) forming, on the first attachment area, a first predetermined attachment electrode pattern, wherein the first predetermined attachment electrode pattern is electrically coupled to the second predetermined electrode pattern.

5,487,212

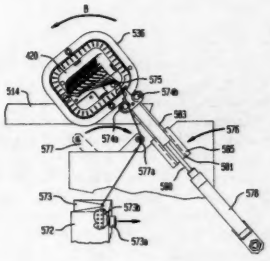
ASSEMBLY AND PACKAGING METHOD FOR NEEDLE AND SUTURE ASSEMBLIES

David Demarest, Parsippany; Robert B. Duncan, Bridgewater; Martin Sobel, Flemington, all of N.J.; Timothy P. Lenihan, Morrisville, Pa.; William Rattan, Cerritos, Calif.; John F. Blanch, Tinton Falls; Michael G. Hodulik, Dunellen, both of N.J., and Dennis P. Yost, Wayne, Pa., assignors to Ethicon, Inc., Somerville, N.J.

Division of Ser. No. 181,606, Jan. 13, 1994. This application Mar. 22, 1995, Ser. No. 408,727

Int. Cl.[6] B23Q *17/00*

U.S. Cl. 29—407 **24 Claims**



1. An automated process for attaching a suture strand to a surgical needle having a suture receiving opening formed therein, and for packaging a needle-suture assembly in a package tray, said process comprising the steps of:

(a) sorting a plurality of needles and orienting each needle for automatic sequential feeding thereof to a first indexing means for transfer to a subsequent swaging workstation;

(b) sequentially swaging each of said fed needles to close said suture receiving opening of each respective needle about a free end of a corresponding suture strand to secure said suture strand thereto and form a needle-suture assembly at said swaging workstation for automatic sequential feeding thereof to a needle packaging station by said first indexing means; and,

(c) sequentially depositing each formed needle-suture assembly in a package tray at said needle packaging station, one needle-suture assembly being deposited in said package tray at the same time said swaging of a subsequent needle about a subsequent corresponding suture strand occurs at said swaging workstation, and, at the same time said sorting of said plurality of needles takes place.

5,487,213

METHOD OF ASSEMBLING AN ELECTRIC MOTOR

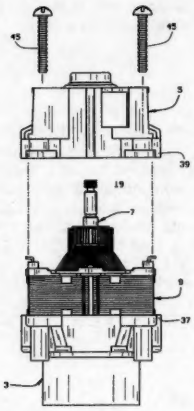
David R. Hult; Jeffery L. Young, both of St. Peters, and Stuart V. Holsten, O'Fallon, all of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed May 2, 1994, Ser. No. 236,198

Int. Cl.[6] H02K *15/14*

U.S. Cl. 29—596 **6 Claims**

1. The method of assembling an electric motor having lower and upper end frames each having peripherally extending stacking/alignment flanges at one end and bearings at an opposite end, an armature assembly rotatably mounted in the bearings of the lower and upper end frames, and a winding field assembly supported between the lower and upper end frames and surrounding the armature assembly, comprising the steps of:



inserting one end of the armature assembly into the bearing of the lower end frame;

positioning the winding field assembly over the armature assembly while also stacking and aligning the winding field assembly on the peripherally extending stacking aligning flange of the lower end frame;

stacking and aligning the upper end frame on the winding field assembly through the positionment of the peripherally extending stacking/alignment flange of the upper end frame on the winding field assembly while also positioning an opposite end of the armature assembly into the bearing of the upper end frame; and

securing the lower end frame, winding field assembly and upper end frame to each other.

5,487,214

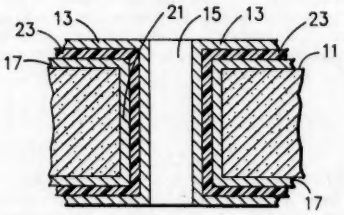
METHOD OF MAKING A MONOLITHIC MAGNETIC DEVICE WITH PRINTED CIRCUIT INTERCONNECTIONS

Michael M. Walters, Endwell, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Division of Ser. No. 727,675, Jul. 10, 1991, abandoned. This application Oct. 9, 1992, Ser. No. 958,878

Int. Cl.[6] H01F *41/06*

U.S. Cl. 29—602.1 **7 Claims**



1. A method of making a magnetic device for surface mounting on a circuit board comprising the steps of:

forming a plurality of holes through a plate of flux permeable material;

plating a first layer of current conductive material in the holes to form a plurality of first windings passing therethrough, such that each of the holes is disposed about only a single one of the plurality of first windings passing therethrough;

plating on both sides of the plate to interconnect at least a portion of the plurality of first windings;

plating regions on the plate, each of the regions connected to at least a portion of the first windings, for use in surface mounting of the magnetic device;

covering the first layer of current conductive material with an insulating layer; and

plating a second layer of current conductive material in the holes on the insulating layer to form a plurality of second windings passing therethrough, such that each of the holes is disposed about only a single one of the plurality of second windings passing therethrough;

plating on both sides of the plate to interconnect at least a portion of the plurality of second windings; and

plating regions on the plate, each of the regions connected to at least a portion of the second windings, for use in surface mounting the magnetic device.

5,487,215

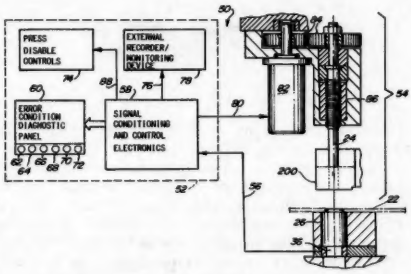
SELF-ADJUSTING HEAD

Harold A. Ladouceur, Livonia, Mich., assignor to Multifastener Corporation, Detroit, Mich.

Filed Feb. 18, 1994, Ser. No. 198,367

Int. Cl.[6] B23P *21/00*

U.S. Cl. 29—702 **26 Claims**



1. A fastener installation apparatus having a plunger with a free end and a die button spaced from said free end, said plunger free end facing said die button, said installation apparatus being adapted to be mounted between the platens of a press for installing a fastener into a panel by impacting said fastener and panel with said fastener installation apparatus during the stroke of one of said platens toward the other of said platens;

said press having a shut height defined as the distance between the platens when said one platen is at the bottom of its stroke;

said fastener installation apparatus being adapted to be operatively mounted between the platens of said press within said shut height and having an operative length defined as the distance between the free end of said plunger and said die button when said one platen is at the top of its stroke;

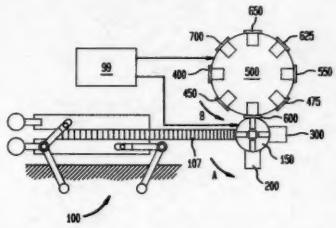
control means operatively coupled to said fastener installation apparatus for periodically adjusting the operative length of said installation apparatus and for controlling said press to ensure proper installation of said fastener into said panel.

5,487,216

CONTROL SYSTEM FOR AN AUTOMATIC NEEDLE-SUTURE ASSEMBLY AND PACKAGING MACHINE

David Demarest, Parsippany, and Michael G. Hodulik, Dunellen, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jan. 13, 1994, Ser. No. 181,607
Int. Cl.[6] B23Q *15/00*
U.S. Cl. 29—705 **57 Claims**



1. An automated system for attaching suture material to a suture receiving opening formed in a surgical needle, and for packaging the suture material and surgical needle attached thereto, said system comprising:

(a) a first means located at a first location for sorting a plurality of randomly oriented needles and orienting each needle of said plurality of needles for automatic handling at a first predetermined location;

(b) a second means located at a second predetermined location for automatically drawing and cutting an indefinite length strand of said suture material and automatically inserting a free end thereof into the suture receiving opening of a needle and swaging the needle about the suture material to form a needle-suture assembly;

(c) a first indexing means for sequentially receiving individual oriented needles at said first location and sequentially transporting said oriented needles from said first location to said second location;

(d) second indexing means for registering a package tray at a third location for sequentially receiving a plurality of needle-suture assemblies from said first indexing means; and

(e) a control means for enabling said first indexing means to sequentially transport a plurality of needle-suture assemblies from said second location to said third location, and enabling the sequential insertion of said needle-suture assemblies into said package tray while registered at said third location,

whereby unsorted needles and an indefinite length of suture material are automatically formed into a plurality of needle-suture assemblies, and then positioned within said package tray at said third location.

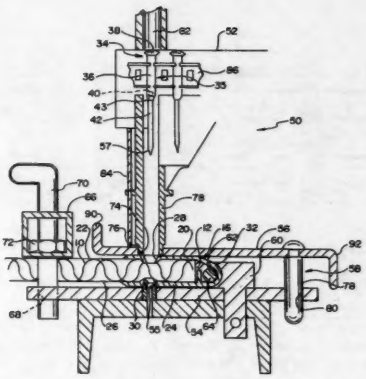
5,487,217

APPARATUS AND SYSTEM FOR INSTALLING RIVETS IN BELT FASTENERS

Thomas W. Richardson, and Mary Jane Richardson, both of 934 Cleveland Rd., Hinsdale, Ill. 60521

Filed Sep. 22, 1993, Ser. No. 125,418
Int. Cl.[6] B23P *19/00*
U.S. Cl. 29—816 **18 Claims**

1. An apparatus for facilitating the attachment of a belt fastener assembly to an end of a belt with rivets and by a non-manually powered rivet assembly drive tool having a rivet assembly dispensing barrel, the belt fastener assembly including an upper plate for overlying one side of the belt end and a lower plate for underlying the other side of the belt end, the upper and lower plates having a plurality of aligned rivet receiving apertures, and each rivet assembly including a rivet having a domed head at one end and a counter sink at an opposite end and a pilot nail extending from the rivet and having a die forming head carried by the rivet counter sink, said apparatus comprising:



an anvil die plate including a plurality of anvil die apertures alignable with the rivet receiving apertures of the upper and lower plates of the belt fastener assembly, each anvil die aperture for receiving a pilot nail and fixing the pilot nail relative to its corresponding rivet to cause the die forming head to deform the counter sink of the rivet and clinching the opposite end of the rivet to the lower plate when the rivet opposite end is power driven against the die forming head;

a guide template for overlying the upper plate of the belt fastener assembly and including a plurality of guide apertures alignable with the anvil die apertures of the anvil die plate and the rivet receiving apertures of the upper and lower plates of the belt fastener assembly when brought into registration therewith, each guide aperture being slightly larger than the rivet assembly dispensing barrel of the non-manually powered rivet assembly drive tool for receiving the rivet assembly dispensing barrel of the non-manually powered rivet assembly drive tool and alligning the rivet assembly dispensing barrel of the rivet assembly drive tool with its respective aligned anvil die aperture and rivet receiving apertures; and

an alignment system for maintaining the alignment of the guide apertures of the guide template with the anvil die apertures of the anvil die plate and the rivet receiving apertures of the upper and lower plates of the belt fastener assembly, said alignment system comprising at least one guide pin carried by said guide template, and at least one guide through bore in the anvil die plate positioned for slidingly receiving said guide pin.

5,487,218

METHOD FOR MAKING PRINTED CIRCUIT BOARDS WITH SELECTIVITY FILLED PLATED THROUGH HOLES

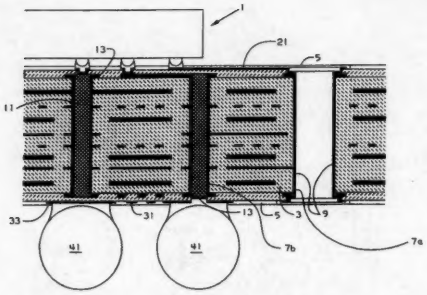
Anilkumar C. Bhatt, Johnson City; Roy H. Magnuson, Endicott; Voya R. Markovich, Endwell; Konstantinos I. Papathomas, and Douglas O. Powell, both of Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 21, 1994, Ser. No. 342,533
Int. Cl.[6] H01K *3/10*
U.S. Cl. 29—852 **2 Claims**

1. A method of preparing a printed circuit board having a film redistribution layer and selective filled plated through holes comprising the steps of:

a. drilling a pattern of holes through a subcomposite for plated through holes, and drilling a sheet of polyimide with the same plated through hole pattern;

b. be seeding the drilled subcomposite with a palladium/tin colloidal suspension whereby to make the exposed surfaces catalytic for electroless Cu plating;



c. electrolessly plating copper over the exposed surfaces of the subcomposite and in the plated through hole barrels to a thickness of about 0.001 to 0.0012 inch;
d. placing a sheet of foil coated with plated through hole filler composition atop the sub-composite to form a stack;
e. laminating the stack to cause the coating composition to soften and flow into the plated through holes and thereafter cure;
f. drilling the subcomposite with the pattern of plated through holes that are to remain unfilled, deburring, and chemical hole cleaning the unfilled plated through hole barrels for plating;
g. seeding the subcomposite with a palladium/tin colloidal suspension, and electrolessly copper plating the seeded subcomposite with an additional 0.0002 to 0.0003 inch of copper;
h. applying a layer of photoresist to the subcomposite, and exposing and developing the layer of photoresist to define a desired pattern of surface circuitization;
i. etching the exposed surface of the subcomposite to form a desired circuit pattern;
j. stripping the photoresist;
k. applying a dry film photoimagable, dielectric polymer, to one or both surfaces of the subcomposite;
l. exposing the photoimagable dielectric with the pattern of the desired vias between the subcomposite circuitry and the circuitry to be formed on the top surface of the dielectric;
m. developing the pattern of via openings, and thereafter processing the dielectric to further cure the dielectric;
n. seeding the dielectric is seeded with colloidal palladium/tin;
o. laminating a subsequent dry film photoresist layer thereto, over the palladium/tin seed layer; imaging the photoresist with the image of the circuitization to be formed, and developing the imaged photoresist;
p. plating the subcomposite with copper to form a film redistribution layer thereon;
q. stripping the photomask from the circuitized composite.

5,487,219

METHOD OF MANUFACTURING ENGINE CRADLES

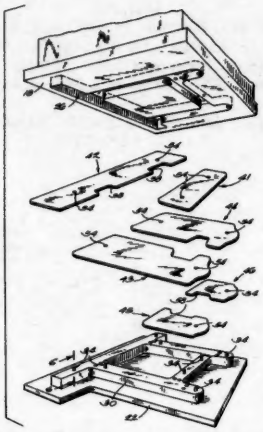
Phillip C. Ruehl, Elm Grove; Stephen L. Kretschmer, Mequon, and Richard J. Behrmann, Colgate, all of Wis., assignors to A. O. Smith Corporation, Milwaukee, Wis.

Filed Aug. 20, 1993, Ser. No. 110,031
Int. Cl.[6] B23P *11/00;* **B21D** *39/00*
U.S. Cl. 29—897 **38 Claims**

1. A method for forming a structural member, said method comprising the steps of:

placing a first sheet member having a length dimension greater than a width dimension in a die in a press,

placing a second sheet member having a length dimension greater than a width dimension in said press, said second member only partially overlapping said first member, said first member only partially overlapping said second member, and the direction of the length dimension of said second mender being angled relative to the direction of the length dimension of said first member, and



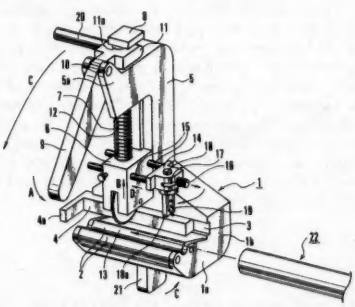
closing said press, thereby attaching said first member to said second member and shaping each of said first member and said second member into a non-planar shape along substantially the entire length thereof.

5,487,220

COAXIAL CABLE TERMINAL PROCESSING TOOL AND PROCESSING METHOD OF THE SAME

Tosiaki Saitou, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Nov. 28, 1994, Ser. No. 345,928
Claims priority, application Japan, Dec. 3, 1993, 5-339026
Int. Cl.[6] H02G *1/00*
U.S. Cl. 30—90.6 **7 Claims**



1. A coaxial cable terminal processing tool comprising:

a processing tool main body having an arm member;

a pair of rollers pivotally supported by said processing tool main body and opposing each other;

an L-shaped cable stopper, disposed in said processing tool main body to be movable in an axial direction of said rollers, for determining a cut position of the coaxial cable, said cable stopper holding the coaxial cable together with said rollers;

a first blade held by said arm member to be movable in a direction perpendicular to a plane defined by said rollers, said first blade being fixedly set in a radial direction of said rollers;

a second blade held by said arm member to be movable in the direction perpendicular to the plane defined by said rollers, and in the axial direction of said rollers, said second blade being variably set at the radial and axial directions of said rollers;

a first moving mechanism for moving said first and second blades to come close to and separate from the plane defined by said rollers; and

a second moving mechanism for moving said second blade in the axial direction of said rollers.

5,487,221

JIG SAW

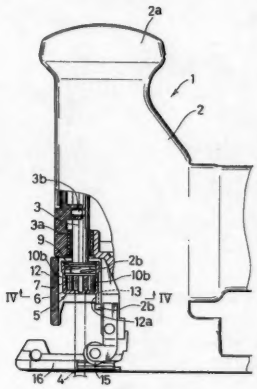
Zenichi Oda, and Toshiyuki Kani, both of Anjo, Japan, assignors to Makita Corporation, Anjo, Japan

Filed Feb. 9, 1995, Ser. No. 385,836

Claims priority, application Japan, Feb. 10, 1994, 6-016677

Int. Cl.[6] B23D *51/10;* **B27B** *19/09*

U.S. Cl. 30—392 **10 Claims**



1. A jig saw comprising:

a housing;

a drive shaft disposed within said housing and driven to perform a predetermined motion;

a holder mounted on said drive shaft and having an operation member operable between a fixing position and a releasing position for fixing and releasing a saw blade, respectively;

a cover mounted on said housing and movable between an open position and a closed position for uncovering and covering said holder, respectively; and

interlocking means for interlocking between said operation member and said cover such that said operation member is moved from said fixing position to said releasing position when said cover is moved from said closed position to said open position.

5,487,222

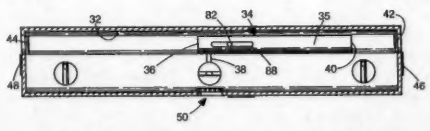
COMBINATION LEVEL

Gary Fairchild, 1129 Dunbarton La., Lexington, Ky. 40502

Continuation-in-part of Ser. No. 106,367, Aug. 13, 1993, abandoned. This application Sep. 19, 1994, Ser. No. 308,147

Int. Cl.[6] G01C *9/28*

U.S. Cl. 33—273 **21 Claims**



1. A combination level without a companion support device, comprising:

a housing having a bottom surface;

a level indicating assembly incorporated within said housing for directly ascertaining horizontal level at a local location;

a remote location viewing assembly cooperating with said level indicating assembly for directly ascertaining horizontal level at a remote location; and

a shallow recess in said bottom surface and having bearings therein for receiving and supporting a tip of a makeshift and discrete stand to assist in ascertaining horizontal level at said remote location.

5,487,223

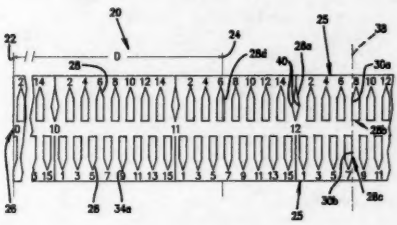
LINEAR SCALE

Anthony E. Krane, 4070 Meadowbrook Blvd., University Heights, Ohio 44118

Filed Oct. 12, 1994, Ser. No. 321,743

Int. Cl.[6] G01B *3/02*

U.S. Cl. 33—494 **11 Claims**



1. A scale, comprising:

an elongated body having opposed scale edges; and

a plurality of slots through the body, each of said slots being located a specified sequential distance from a reference point, each of said slots having opposed slot edges, and said slots being alternatingly located along said opposed scale edges such that one of the slot edges of each of the slots is collinear with one of the slot edges of an opposite one of the slots and the other of the slot edges of each of the slots is collinear with one of the slot edges of another opposite one of the slots.

5,487,224

DEVICE FOR THE HEAT TREATMENT OF MOVING YARNS

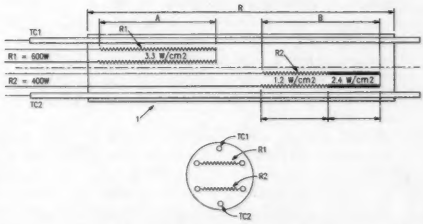
Carlos M. Gabalda, Granges les Valence, and Pierre Mirabel, Roanne, both of, France, assignors to ICBT Roanne, France

Filed Jul. 11, 1994, Ser. No. 273,111

Claims priority, application France, Jul. 20, 1993, 93 09147

Int. Cl.[6] F26B *3/34*

U.S. Cl. 34—266 **6 Claims**



1. A device for heat treating a moving yarn comprising an insulating chamber, guide means and a cylindrical heating unit, said heating unit being surrounded by said insulating chamber and comprising two heating zones obtained by embedding two resistance elements inside said heating unit, parallel, but offset with respect to each other; with each heating zone including an associ-

ated thermocouple element associated with a respective one of said two resistance elements;

said insulating chamber defining a channel through which said yarn passes and said guide means positioning said yarn within said channel, wherein said guide means are provided on either side of each heating zone; and

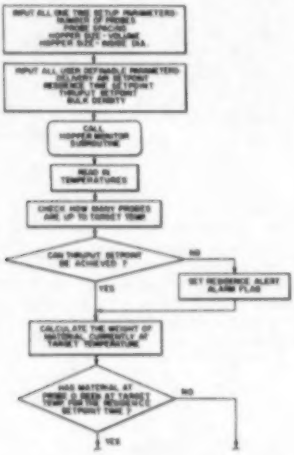
wherein said yarn first enters a first of said heating zones, which is set to a temperature greater than a normal temperature to which said yarn is to be heated, for a length of time such that said yarn is not damaged, and said yarn subsequently enters a second of said heating zones set at said normal temperature.

5,487,225

APPARATUS AND METHOD FOR CONTROLLED DRYING OF PLASTIC PELLETS

John P. Downie, Titusville, Pa., assignor to The Conair Group, Inc., Pittsburgh, Pa.

Filed Nov. 14, 1994, Ser. No. 338,418
Int. Cl.[6] F26B *3/14;7/00*
U.S. Cl. 34—473 **20 Claims**



1. In a dryer hopper for drying plastic pellets having heated air passing upwardly through said hopper with an air outlet at the top of said hopper the improvement comprising:

a plurality of temperature sensors positioned at vertical incremental distances from the bottom of said hopper to the top of said hopper whereby the temperature of pellets at the vertical level of each of said plurality of temperature sensors may be measured to provide an indication of the dryness of said pellets at the vertical level of each of said plurality of temperature sensors;

said plurality of temperature sensors being connected to recording means to record the temperature of said pellets at the vertical level of each of said sensors through a specified time period; and

each of said plurality of temperature sensors having a target temperature to be maintained for a specified residence time to provide dry pellets at the vertical level of each of said sensors.

17. The method of determining when a preselected amount of plastic pellets that are being dried by passing heated air upwardly through them within a dryer hopper are properly dry for use in a manufacturing process comprising the steps of:

placing a plurality of temperature sensors within said hopper in contact with said pellets at varying vertical distances from the bottom to the top of said hopper;

determining when each of said temperature sensors reaches a specified target temperature;

measuring the residence time at which the pellets in contact with each of said temperature sensors remains at said target temperature; and

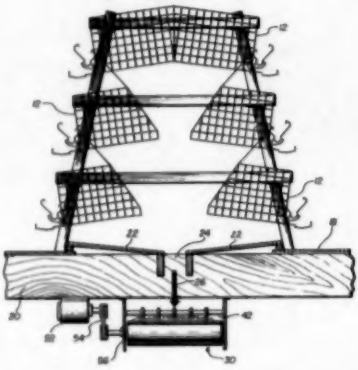
calculating the amount of pellets in said hopper below the vertically highest positioned temperature sensor that has been maintained at said target temperature for said residence time to determine if said amount is equal to or greater than said preselected amount.

5,487,226

MANURE DRYING SYSTEM AND RELATED METHOD

Don R. Hoover, Milford, Ind., assignor to CTB, Inc., Milford, Ind.

Filed Aug. 26, 1994, Ser. No. 296,693
Int. Cl.[6] F26B *3/00*
U.S. Cl. 34—503 **20 Claims**



10. A method for reducing the moisture content in animal manure comprising the steps of:

a. providing an animal confinement facility for housing animals;

b. supplying a ventilating air flow within said animal confinement facility;

c. providing accumulating apparatus for collecting and holding manure deposited within the confinement facility by the animals, and;

d. concentrating and channeling a portion of the ventilating air flow over the accumulating apparatus to cause a significant reduction in the moisture content of the manure collected and held by the accumulating apparatus.

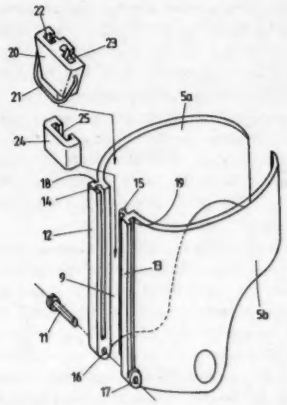
5,487,227

SKI BOOT WITH A COLLAR HAVING A CLOSURE SLIDE

Gilles Marmonier, Saint Etienne de Crossey, France, assignor to Skis Rossignol S.A., Voiron, France

Filed Feb. 16, 1994, Ser. No. 197,163
Claims priority, application France, Mar. 12, 1993, 93 02899
Int. Cl.[6] A43B *5/04;* **A43C** *11/00*
U.S. Cl. 36—117 **8 Claims**

1. A ski boot with a shell for a skier's foot comprising a lower shell having a front and a heel **(1)** intended to surround the foot and a boot leg **(5)** having a rear and an upper edge being in the form of a collar which is articulated on the lower shell and fitted, at the front, with at least one closure and tightening device **(6, 7)**, wherein the boot leg has, at the rear, at least one slot **(9)** having edges and extending, from the upper edge of the boot leg, over most of the height of the boot leg, toward the heel, the edges of the slot having an overthickness **(12, 13)**, the overthickness **(13)** of one of the edges having a male profile **(15)** and the overthickness **(12)**



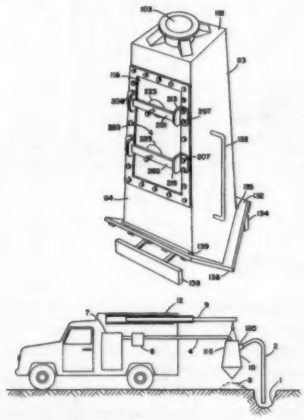
of the other edge having a matching female profile (**14**), so as to ensure mutual fastening of its edges by forcible engagement of the male profile into the female profile, and wherein the boot leg includes a closure slide (**20**) slidingly mounted astride the said edges, the displacement of the slide along said slot closes and opens the slot in the manner of a zipper, a device (**26**) at the rear for locking the boot leg on the shell, in a forward inclined position, wherein this device (**26**) being connected to the closure slide (**20**) by a linkage member (**30**) such that the device is unlocked when the slide occupies it's topmost position on the boot leg.

5,487,228

MATERIAL TRANSFER APPARATUS AND METHOD

Joseph Marazzo, Scotch Plains, N.J.; Frank Russo, Swiftwater, Pa.; Michael G. Palmer, Easton, Pa., and Gary L. Hartmann, East Stroudsburg, Pa., assignors to Brooklyn Union Gas, Brooklyn, N.Y.

Filed Mar. 16, 1994, Ser. No. 213,520
Int. Cl.[6] **B65G** *53/14;65/72*
U.S. Cl. 37—317 **21 Claims**



1. A material transfer device comprising:

a top section including a vacuum inlet for applying suction to the device;

a middle section including plurality of sides, each side extending downward and outward from the top section, a first of the plurality of sides including a material inlet and a second of the plurality of sides opposite the first side including a vibratory part vibrating in response to vacuum pressure in the middle section caused by the suction; and

an openable bottom section held in a closed position against the plurality of downward and outward extending sides of the middle section by suction applied to the vacuum inlet,

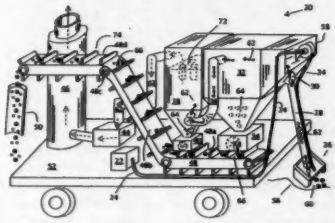
wherein material entering the middle section through the material inlet in response to the suction applied to the vacuum inlet is directed to contact the vibratory part of the second side and is redirected from the vibratory part to the openable bottom section.

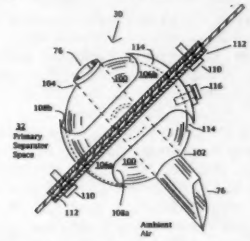
5,487,229

APPARATUS FOR PNEUMATIC EXCAVATION

Richard D. Nathenson; Jerome Apt, Jr.; Martin J. Uram, all of Pittsburgh; Paul M. Brumbaugh, North Versailles, all of Pa.; Gary H. Brawley, Columbus, Ohio; Donald J. Hackman, Upper Arlington, Ohio, and Brian Christenson, Columbus, Ohio, assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed May 28, 1993, Ser. No. 68,920
Int. Cl.[6] **E02F** *5/02*
U.S. Cl. 37—347 **23 Claims**





1. An apparatus for pneumatically excavating soil from an excavation face comprising a movable support structure, a vessel mounted on the support structure defining an internal chamber, a boom member carried by the support structure and having first and second end portions and a longitudinal axis and having a passageway extending between the first and second end portions, means for connecting the first end portion to the vessel so that the passageway in the boom member is in communication with the internal chamber of the vessel which includes a sphere secured to the first end portion of the boom member and a retainer carried by the vessel having a cavity for cooperatively receiving the sphere so that the first end portion of the boom member is pivotably connected to the vessel, the sphere being provided with a slot extending in a plane that contains the longitudinal axis of the boom member and a pin being carried by the retainer and having a portion which extends into the slot along a radius of the sphere for restricting rotation of the boom member about its longitudinal axis, means carried by the second end portion of the boom member for dislodging soil from the excavation face when the second end portion of the boom member is placed in the vicinity of the excavation face and means carried by the support structure and connected to the vessel for creating a negative pressure within the internal chamber of the vessel and the passageway of the boom member for lifting the dislodged soil from the excavation face into

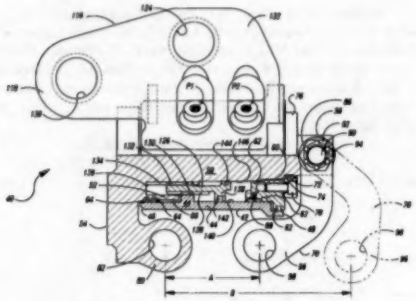
the second end portion of the boom member and for carrying the dislodged soil through the passageway and into the internal chamber.

5,487,230

TOOL ACTUATOR WITH ADJUSTABLE ATTACHMENT MOUNT

Dean R. Weyer, 707 Victor, Enumclaw, Wash. 98022

Filed Dec. 14, 1994, Ser. No. 355,593
Int. Cl.[6] E02F *3/36*
U.S. Cl. 37—468 **16 Claims**



9. A fluid-powered tool actuator, usable with a vehicle having an arm and a rotation link associated therewith for rotation of the tool actuator in a first plane defined by movement of the rotation link relative to the arm, each of the arm and rotation link having an attachment member located toward a free end thereof, and usable with a plurality of tools each having a first tool attachment member and a second tool attachment member located away from the first tool attachment member where the distance between the first and second tool attachment members varies from tool to tool within a range of tool attachment member distances, the tool actuator comprising:

a body having a longitudinal axis and first and second ends;

an attachment bracket rigidly attached to said body and having an external first bracket attachment member located generally along said body axis for pivotal attachment to the vehicle arm by the arm attachment member and an external second bracket attachment member located generally along said body axis away from said first bracket attachment member for pivotal attachment to the rotation link by the rotation link attachment member, said first and second bracket attachment members being selectively detachable from the arm and rotation link attachment members, wherein with said first and second bracket attachment members attached to the arm and rotation link attachment members, movement of the rotation link causes said body to rotate about the vehicle arm with movement of said longitudinal axis of said body in generally parallel alignment with the first plane, and wherein the tool actuator is selectively detachable from the vehicle arm and rotation link;

an output shaft rotatably disposed within said body in general coaxial arrangement with said body and having a first shaft end portion extending at least to said first body end and a second shaft end portion extending toward said second body end, said first shaft end portion having a first shaft attachment member attached thereto which is releasably attachable to the first tool attachment member;

a member pivotally attached to said second shaft end portion to pivot about an axis generally transverse to said second shaft end portion, said pivotable member having a second shaft attachment member attached therejo which is releasably attachable to the second tool attachment member, said pivotable member being selectively pivotable to move said second shaft attachment member within a range of distances corresponding to the range of tool attachment member distances and position said second shaft attachment member at a selected distance from said first shaft attachment member such that said first and second shaft attachment members are spaced apart by the same distance as the first and second tool attachment members for the tool being attached to said shaft, said first and second shaft attachment members releasably attaching the tool to said shaft for rotation with said shaft through a second plane extending laterally, generally transverse to the first plane; and

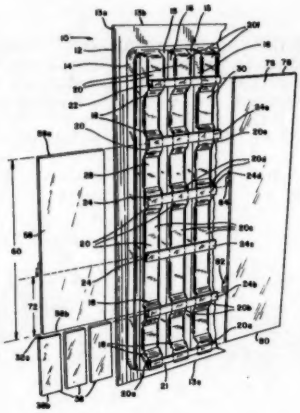
a linear-to-rotary torque transmitting member mounted for longitudinal movement within said body in response to selective application of pressurized fluid thereto, said torque-transmitting member engaging said body and said shaft to translate longitudinal movement of said torque-transmitting member into rotational movement of said shaft relative to said body, whereby the tool attached to said shaft is rotatable in the first plane and laterally tiltable in the second plane.

5,487,231

ATTRACTION BOARD FOR RETAINING AN ENLARGED FIGURE PANEL THEREON

Anton Grate, 405 Westridge, Joliet, Ill. 60435

Filed Dec. 20, 1993, Ser. No. 169,100
Int. Cl.[6] G09F *7/02*
U.S. Cl. 40—618 **5 Claims**



1. The combination comprising;

a back,

a plurality of parallel tracks on said back, each of said tracks having an upwardly extending lower lip immovably fixed said back and an opposing downwardly extending upper lip immovably fixed to said back,

said tracks including an upper track with an upper lip and a lower track with a lower lip, and an intermediate lip,

one of said upper lip of said upper track and said lower lip of said lower track being forwardly offset relative to said intermediate lip, and

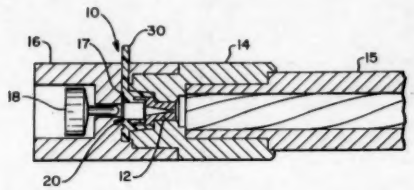
a figure panel extending under said upper lip of said upper track and under said lower lip of said lower track, and across said intermediate lip.

5,487,232

DETONATOR ASSEMBLY

William E. Osborne, Guilford; Harold J. Waterman, Jr., Wallingford, and David Findlay, Guildford, all of Conn., assignors to The Marlin Firearms Company, North Haven, Conn.

Filed Apr. 26, 1994, Ser. No. 233,134
Int. Cl.[6] F41C *9/08*
U.S. Cl. 42—51 **20 Claims**



1. A detonator assembly for a black powder firearm having a nipple and a breech block having an axial bore for receiving said detonator assembly, said detonator assembly comprising:

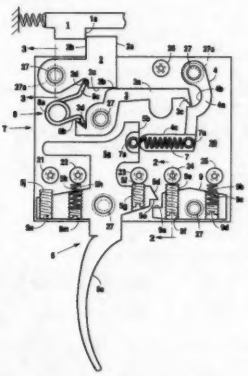
primer means having a cylindrical first portion and a generally flattened end; and a primer carrier having a first end, a first portion dimensioned to receive said primer means, and a second portion dimensioned for partially receiving the firearm nipple, said primer carrier second portion comprising first and second coaxial sleeve means defining an interior circumferential annular recess, said second sleeve means defining a sealing surface for sealing with the nipple.

5,487,233

TRIGGER MECHANISM FOR FIREARMS

Jewell, Arnold W., 1490 White Water Rd., New Braunfels, Tex. 78132

Filed Feb. 13, 1995, Ser. No. 388,144
Int. Cl.[6] F41A *19/16*
U.S. Cl. 42—69.01 **8 Claims**



1. A trigger mechanism for cocking and releasing a spring pressed firing pin of a firearm, comprising, in combination:

a trigger housing comprising two horizontally spaced vertical plate elements mountable below said firing pin;

a sear pivotally mounted between said plate elements and releasably engagable with the firing pin in a first pivotal position to secure the firing pin in its cocked position, and disengagable from the firing pin in a second pivotal position;

a sear release lever pivotally mounted between said plate elements and engagable with said sear in one pivotal position to hold said sear in its said first position, and pivotally movable to a second pivotal position permitting movement of said sear to its said second pivotal position;

a locking lever for said sear release lever pivotally mounted between said plate elements and movable between a first pivotal position engaging said sear release lever to hold said sear release lever in its said first position and a second pivotal position permitting movement of said sear release lever to its said second position;

a trigger element medially pivotally mounted between said plate elements below said sear and movable between an initial unpulled position to a pulled firing position;

said trigger element having a finger piece projecting downwardly out of said trigger housing and an upwardly projecting actuating portion;

means abuttingly interconnecting said trigger actuating portion and said locking lever, whereby pulling movement on said finger piece effects movement of said locking lever to its said second position, permitting movement of said sear release lever and said sear concurrently to their respective second positions to release the spring pressed firing pin to fire the firearm;

first resilient means operatively connected between said upwardly projecting actuating element of said trigger and said locking lever to return said locking lever to its said first position upon release of said finger piece of said trigger element; and

a second resilient means operable to return said sear and said locking lever to their respective first positions when the firing pin is retracted to its cocked position;

said trigger element having forwardly and rearwardly projecting medial portions;

a plurality of spacer elements securing said vertical plate elements in said horizontally spaced relation;

a spring operating between one of said spacers and said rearwardly projecting portions of said trigger element to urge said trigger to an initial, unpulled position;

a vertically adjustable trigger positioning screw in said forward projecting portion of said trigger;

a second one of said spacer elements abuttingly engaged by said trigger positioning screw to determine said initial unpulled position of said trigger;

a second vertically adjustable screw in said rearwardly projecting portion of said trigger element; and

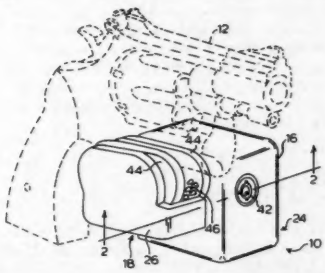
a third one of said spacer elements abuttable by said second vertically adjustable screw to determine the limiting pulled position of said trigger element.

5,487,234

FIREARM LOCKING DEVICE WITH MOTION SENSOR AND ALARM

Paul K. Dragon, 1366-B Jeffords St., Clearwater, Fla. 34616

Filed Nov. 29, 1993, Ser. No. 158,923
Int. Cl.[6] F41A *17/54*
U.S. Cl. 42—70.07 **23 Claims**



1. A firearm locking device and alarm to be detachably mounted on a trigger guard of a firearm to prevent operation and deter movement of the firearm, comprising:

(a) a first section being configured to fit over the trigger guard of the firearm;

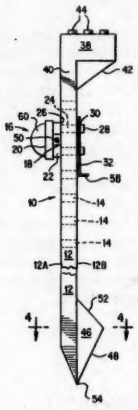
(b) a second section being configured to fit over the trigger guard of the firearm in laterally opposed relationship to the first section to form a firearm locking device and alarm assembly;

(c) means for lockably connecting the first section and the second section against opposite faces of the trigger guard extending transversely through the trigger guard and in proximity to the trigger so as to engage therebetween, substantially enclosing and preventing access to, the trigger and trigger guard of the firearm;

(d) motion sensing means operatively associated with the firearm locking device and alarm assembly for sensing movement of the firearm; and

(e) an alarm means operatively associated with the firearm locking device and alarm assembly for providing an alert signal in response to the movement of the firearm.

5,487,235
SUPPORT APPARATUS FOR FENCING
Glenn D. Gober, 27 President Ave., Rutledge, Pa. 19070
Filed Aug. 26, 1993, Ser. No. 112,677
Int. Cl.[6] A01G *17/06*
U.S. Cl. 47—46 **5 Claims**



1. A support apparatus for garden fencing, comprising:

(a) an elongate shaft having a plurality of incrementally spaced apertures therethrough along the length of said shaft; said apertures being adjacent to one another;

(b) a U-shaped bridge member for securing a section of fence to said shaft; said bridge member having two cylindrical pins and a closed section therebetween; said pins of said bridge member being adapted to be slidably received within said apertures such that said section of fence is disposed between the closed section of said bridge member and said shaft; and

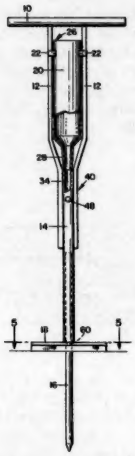
(c) a clip adapted to engage said pins of said bridge member for securing it to said shaft.

5,487,236
PLANT FOOD AND FERTILIZER APPLICATOR
Donald D. Moon, 40 Worcester Ave., Springfield, Mass. 01107
Filed Feb. 27, 1995, Ser. No. 394,503
Int. Cl.[6] A01G *29/00*
U.S. Cl. 47—48.5 **2 Claims**

1. Soil conditioning apparatus comprising:

a vertically disposed main body,

a manually engageable handle secured to an upper portion of the main body,



a fertilizer receiving chamber secured to the main body and having upper and lower open ends,

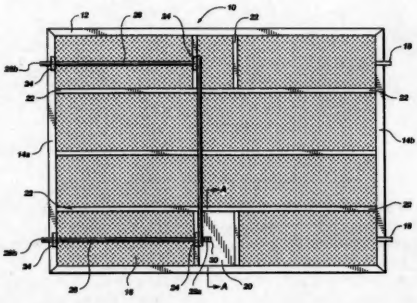
an open-ended hollow dispensing tube fixed to the main body below and in communication with the fertilizer receiving chamber,

an apertured lateral slide having an intercepting relationship with the tube interior and being shiftable between a communicating position with the slide aperture being aligned with the tube interior and a non-communicating position with the aperture of the slide being in non-alignment with the hollow of the hollow tube,

ground penetrating tine secured to and in vertical alignment with the main body for easy insertion into the ground,

and a lateral pedal fixed to the main body facilitating the penetration of the tine upon the exertion of foot pressure on the pedal.

5,487,237
SECURITY DEVICE FOR BUILDINGS
Bill Martin, Jr., 704 S. 400 West, Salt Lake City, Utah 84101
Filed Aug. 2, 1994, Ser. No. 284,390
Int. Cl.[6] E06B *3/68*
U.S. Cl. 49—57 **14 Claims**



1. A security device for releasably blocking a doorway or window opening of a building structure, said device comprising:

a sturdy, continuous, metal frame configured to fit within an interior perimeter of the doorway or window opening, said frame defining an interior frame opening bounded on at least two opposing sides by first and second frame members which

are substantially contiguous with sides of the doorway or window opening when in a secured position;

a security grid extending across and covering the interior frame opening and being anchored to the metal frame to form a single structure;

at least one positioning bar disposed on the second frame member and configured for placing into a receiving slot formed in the interior perimeter of the window or door opening; and

a locking bar slidably disposed on the first frame member and having at least one perimeter locking end configured for slidable entry into a receiving slot formed in the interior perimeter of the window or door opening, wherein the locking bar comprises an elongate locking rod having at least one interior locking end;

means for releasbly restraining said locking bar from movement relative to the metal frame when said locking bar is seated within the receiving slot in the interior perimeter to retain said metal frame in a secure position;

at least one mounting plate coupled to the continuous metal frame and security grid and extending into the interior frame opening;

at least one first guide tab securely attached to the mounting plate and extending outward from the mounting plate, said at least one first guide tab including a guide track opening configured to slidably receive the locking rod;

at least one second guide tab securely attached to the first frame member and extending outward from the first frame member, said at least one second guide tab including a guide track opening configured to slidably receive the locking rod;

wherein the locking rod is slidably journalled within the at least one first and second guide tabs;

the means for releasably restraining comprising means for releasably interlocking the interior locking end of the locking rod with the at least one mounting plate when the locking rod is seated within the receiving slot in the interior perimeter to retain the metal frame in a secured position.

5,487,238

DEVICE FOR OPENING AND CLOSING A WINDOW, A DOOR, OR THE LIKE

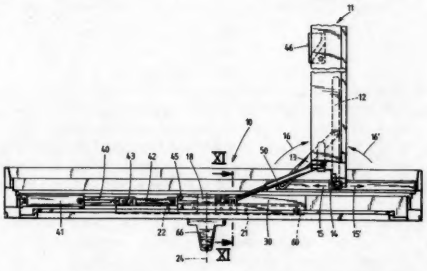
Werner Eikmeier, Erkrath; Dietger Frick, and Werner Riedel, both of Velbert, all of, Germany, assignors to Wilhelm Weidtmann GmbH & Co. KG, Velbert, Germany

Filed Nov. 10, 1994, Ser. No. 337,680

Claims priority, application Germany, Apr. 2, 1994, 44 11 638.1

Int. Cl.[6] E05F *11/02*

U.S. Cl. 49—300 **19 Claims**



1. In a device for opening and closing a window, a door, or the like having a stationary frame and having a casement moveable between a closed position and an open position, which is connected to the frame by at least one hinge part, having a toothed rack, longitudinally displaceable by a rotary operated actuating means which is connected to the casement by a hinge rod and wherein the hinge rod transfers longitudinal displacement of the toothed rack into movement of the casement, and having at least one pair of closing elements between the casement and the frame which is composed of a moveable and a stationary closing element, and acts to ensure said closed position of the casement, the moveable closing element of which can be changed over, by a closing rod, between a latched position holding the casement against the frame and an unlatched position releasing the casement, the improvement comprising: that said toothed rack is a first toothed rack cooperating with the casement, and that a second toothed rack is arranged in the frame, which is connected to the closing rod for the moveable closing element located in the frame, both toothed racks being longitudinally capable of being displaceable by the same actuating means, only one of said two toothed racks being ordinarily coupled to the actuating means, while the other is uncoupled and stationary, and wherein the ordinarily coupled toothed rack uncouples itself automatically from the actuating means after a predetermined distance of travel and the final phase of its longitudinal displacement serves to couple the other toothed rack to the actuating means.

5,487,239

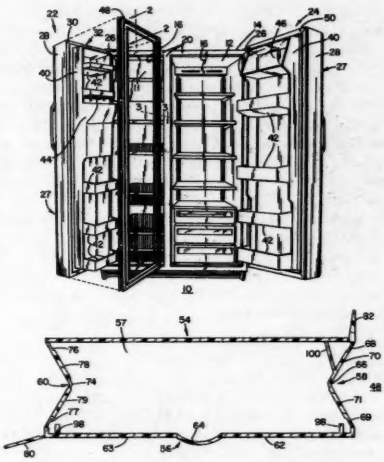
REFRIGERATOR GASKET ASSEMBLY

Thomas E. Jenkins; Charles R. Mulligan, and Duane Jubenville, all of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jun. 6, 1994, Ser. No. 254,396

Int. Cl.[6] E06B *7/22*

U.S. Cl. 49—498.1 **19 Claims**



1. A refrigerator comprising:

a cabinet having an outer case and an inner liner, a storage compartment formed by said liner and having an access opening surrounded by a cabinet face portion;

a door hingedly mounted along one of its edges for selectively closing said access opening, said door including a peripheral flange;

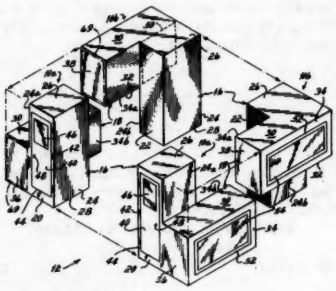
an elongated gasket mounted on said door peripheral flange for sealing engagement with said cabinet face portion when said door closes said access opening;

said gasket comprising an elongated body of co-extruded material including an elongated base wall mounted along said door flange, a contact wall overlying and spaced from said base wall for sealing engagement with said cabinet face portion, and a pair of spaced apart flexible side walls joining said base and contact walls and forming therewith a hollow interior containing compressible insulation material; and

said contact wall comprising a pair of longitudinally extending strips of more rigid material connected by an longitudinally

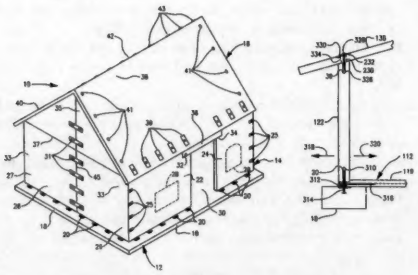
extending strip of less rigid material; said strip of less rigid material being formed with an elongated bow projecting away said base wall.

5,487,240
COMPACT SLEEPING UNIT
Frederick H. Miller, 3627 Hillside Ave., Cincinnati, Ohio 45204
Continuation-in-part of Ser. No. 134,007, Oct. 12, 1993. This application Nov. 18, 1994, Ser. No. 342,354
Int. Cl.[6] E04H *3/04*
U.S. Cl. 52—33 **29 Claims**



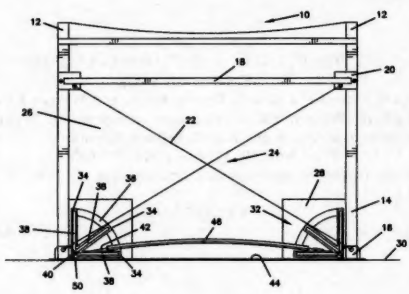
1. A structure suitable for human habitation comprising:
a generally rectangular, vertically oriented cell, said vertical cell having a back wall spaced from a front wall and a pair of spaced side walls, said vertical cell having an internal volume of sufficient size for a person to stand upright therein;
a generally rectangular, horizontally oriented cell, said horizontal cell having a ceiling spaced from a floor and a pair of spaced side walls, said horizontal cell having an internal volume of sufficient size for the person to recline therein;
a platform in said horizontal cell upon which the person can recline;
said horizontal and vertical cells being connected to form a unit so that a portion of one of said horizontal cell side walls is juxtaposed to a portion of one of said vertical cell side walls; and
a passage between said cells through which the person can move to and between said cells.

5,487,241
WIND RESISTANT BUILDING SYSTEM
James E. Gorrell, and David G. Gorrell, both of P.O. Box 60174, Fort Myers, Fla. 33906
Filed Feb. 14, 1994, Ser. No. 194,827
Int. Cl.[6] E04H *1/00;* **E04B** *1/00*
U.S. Cl. 52—79.1 **15 Claims**



1. A wind resistant concrete building comprising:
a concrete base section;
a wall section including a plurality of discrete concrete wall panels, each said wall panel interengaging and extending substantially perpendicularly from at least one other said wall panel to reinforce said wall section;
means for fastening together each said pair of interengaging wall panels;
means for securing said wall section to said base section;
a concrete roof section including at least one precast roof panel that is mounted to said wall section; and
means for attaching said roof section to each of said wall panels;
said base section including a poured concrete floor in which said wall panels are set and a concrete footer portion formed at least partly beneath said floor;
said means for securing including a threaded receptacle that is cast in a said wall panel proximate a lower edge thereof and a threaded element that is engaged with said receptacle and has a head that engages said footer portion and a shaft that extends through said floor, said threaded element being longitudinally adjusted in said receptacle before said floor is poured to adjust the height of said wall structure relative to said footer portion;
said means for securing further including a weld plate cast into said footer, said head of said threaded element engaging and being welded to said weld plate before said floor portion is poured.

5,487,242
METHOD AND APPARATUS FOR UNIFORMLY TENSIONING FABRIC PANELS OF PORTABLE BUILDINGS
Robert M. Stafford, 4838 Solus Pl., Weed, Calif. 96094
Filed Apr. 26, 1994, Ser. No. 233,122
Int. Cl.[6] E04B *1/32*
U.S. Cl. 52—86 **16 Claims**



6. A portable building structure, comprising:
a plurality of arches, each arch spanning a transverse distance and being longitudinally spaced apart from adjacent arches, each arch having lower ends attached to base plates, the base plates having at least one J-bracket with a flat center and a curled end located near each respective arch, the base plates securing the lower ends of the arches in the longitudinally spaced, transversely extending, vertical positions;
a plurality of horizontally extending purlins rigidly connected between the adjacent arches at opposite ends of the purlins;
a plurality of lines connected to base plates and opposite ends of the purlins to form cross-braces between the adjacent arches; and
one or more panels attached to the adjacent arches, each panel having a width corresponding to the longitudinal distance between adjacent arches, a length corresponding to the transverse distance spanned by the arches, means for connecting the panels to corresponding arches, and reinforced lower corners located near the lower ends of the arches, wherein each panel has a first line secured to longitudinally opposite reinforced corners and extending generally arcuately therebe-

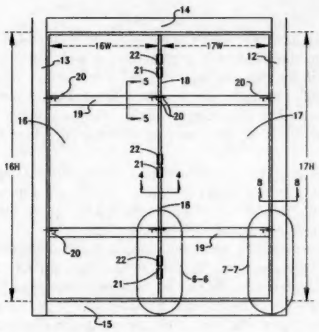
tween and a second line secured by the J-bracket to longitudinally opposite reinforced corners and extending generally linearly therebetween, both first and second lines being spaced a predetermined distance apart in the transverse direction to thereby longitudinally and transversely tension each respective panel.

5,487,243

STORM SHUTTER SYSTEM

Joseph F. Hale, Dublin, Va., and Jeffrey Burgardt, Indianapolis, Ind., assignors to Lin El, Inc., Mooresville, Ind.

Filed Nov. 4, 1993, Ser. No. 147,748
Int. Cl.[6] E06B *3/26*
U.S. Cl. 52—202 **20 Claims**



1. A storm shutter system, comprising:

a window mounted within a window frame and separating a building exterior from a building interior;

a plurality of shutter panels substantially flush against and covering an interior surface of said window, said panels having perimeter edges and compressible members attached about said perimeter edges for creating seals between the shutter panels and the window frame and between perimeter edges of the shutter panels which abut one another;

said panels together further being slightly oversided relative to said window frame such that when said panels are positioned flush against said window, said compressible members are compressed against said window frame thereby creating a seal between said panel members and said window frame and also creating a seal between perimeter edges of said panel members which abut one another;and

one or more cross bar members mounted interiorly of said panels so as to support said panels against positive pressure.

5,487,244

SHUTTER SYSTEM AND METHOD

George A. Hill, 8561 NW. 52nd St., Lauderhill, Fla. 33351

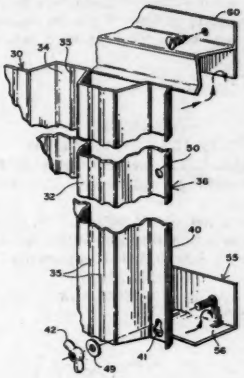
Filed Nov. 23, 1994, Ser. No. 344,222
Int. Cl.[6] E06B *3/26*
U.S. Cl. 52—202 **7 Claims**

1. A shutter panel for use in a shutter system having a header and a footer for receiving a plurality of such shutters, said shutter comprising, in combination:

a corrugated body having a central groove and parallel flanking ridges, said groove and ridges comprising an isosceles trapezoidal cross-section;

a plurality of ribs longitudinal along said ridges and grooves, extending outwardly therefrom;

said panel having lateral edges terminating in a pair of parallel lips;



each such lip having a lip bottom and an edge lock angled upwardly from the lip bottom, such that each panel can be overlapped with a like panel along their lips;

vertically spaced releasably securable means along the lip bottoms for securing said panel to a like panel that has been placed adjacent thereto and overlapped along the lip; and

a laterally spaced releasably securable means for securing said panel to the footer,

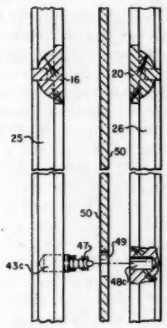
whereby like panels, when placed adjacent said panel and overlapped along the lips, can be secured both to the footer and to each other to form an interlocked panel system that inhibits wind from getting between the adjacent, overlapped panels.

5,487,245

PANELLED LIGHT TRANSMISSIVE MEMBER

Jeanette Dazo, Greenville; Hermon G. Reiber, Commerce; Richard Knighton, Carrollton, and Spurgeon T. Peaden, Rockwall, all of Tex., assignors to Wing Industries, Inc., Dallas, Tex.

Filed Feb. 18, 1994, Ser. No. 198,865
Int. Cl.[6] F06B *3/68*
U.S. Cl. 52—204.61 **24 Claims**



1. A multi-panelled light transmissive member comprising:

(a) a sheet of light transmissive material having a plurality of holes therethrough;

(b) a peripheral wood frame;

(c) mounting means for mounting said sheet of light transmissive material within said peripheral wood frame;

(d) a plurality of wood muntins mounted on opposite sides of said sheet of light transmissive material in complementary disposition to seemingly segment said sheet of light transmissive material into apparent sub-panels; and

(e) a plurality of Christmas-tree fasteners positioned within said holes and engaging said wood muntins thereby to lock said wood muntins to said light transmissive material.

5,487,246

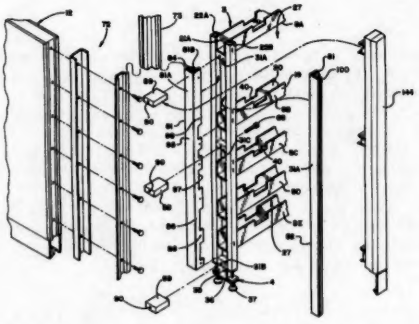
UTILITY PANEL SYSTEM

Ronald R. Hodges, Grandville, and George V. Weller, Grand Rapids, both of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Continuation of Ser. No. 36,067, Mar. 23, 1993, Pat. No. 5,341,615, which is a continuation of Ser. No. 639,513, Jan. 10, 1991, Pat. No. 5,209,035. This application Jul. 6, 1994, Ser. No. 271,376

Int. Cl.[6] E04B *5/48*

U.S. Cl. 52—220.7 **17 Claims**



1. A freestanding, portable utility panel for open office spaces and the like, comprising:

a relatively thick, skeleton-like frame having:

first and second oppositely oriented faces; a foot portion shaped to abuttingly support said utility panel on a floor surface;

first and second oppositely positioned side portions shaped for operable connection with opposite sides of adjacent, like frames to create a substantially freestanding utility panel system;

a first pair of rigid uprights positioned adjacent the first side portion of said frame along the opposite faces thereof;

a second pair of rigid uprights positioned adjacent the second side portion of said frame along the opposite faces thereof; each of said uprights being tubular, with a rear face thereof connected adjacent the associated side portion of said frame, and a front face thereof extending outwardly of said rear face;

each of said first and second pairs of uprights having at least two elongated connectors having opposite end portions thereof attached to and extending generally horizontally between said upright pair at vertically spaced apart locations thereon to rigidly interconnect the same in a mutually parallel, laterally spaced relationship to define an open interior portion of said utility panel through which utilities can be routed; and

at least one cover panel shaped to cover at least a portion of one of the faces of said frame and being detachably connected therewith to provide ready access to said interior portion of said utility panel.

5,487,247

VENTILATED ROOF AND WALL STRUCTURE

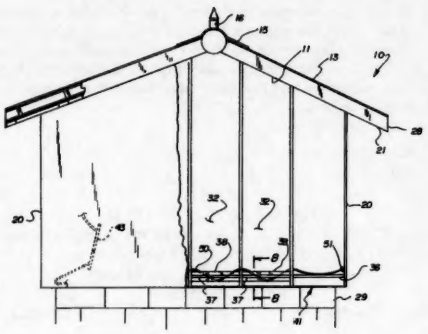
Willard L. Pigg, 1080 N. Brace Rd., Summertown, Tenn. 38483

Filed Jun. 11, 1994, Ser. No. 273,487

Int. Cl.[6] E04F *17/04;* **F24F** *7/00*

U.S. Cl. 52—302.3 **2 Claims**

1. A ventilated roof structure comprising:



a dwelling having at least one exterior side wall and at least one interior side wall and a plurality of wall studs extending between the exterior side wall and the interior side wall, the stud each having a cable aperture directed therethrough;

a base roof plate extending over the exterior side wall and the interior side wall, the base roof plate having a base roof peak ridge;

a top roof plate fixedly secured in a spaced relationship relative to the base roof plate to define a roof air gap extending between the base roof plate and the top roof plate, the top roof plate having a top roof plate peak ridge;

an air tube mounted and fixedly secured coextensively relative to the base roof plate peak ridge and the top roof plate peak ridge, the air tube having at least one vent pipe projecting exteriorly of the dwelling and the top roof plate, the vent pipe being in pneumatic communication with the air tube, and the air tube being in pneumatic communication with the roof air gap;

an attic space within the dwelling positioned in adjacency to the base roof plate, with a plurality of attic vents extending between the attic space and the air tube;

a foundation wall, the exterior side wall being secured to the foundation wall, the foundation wall including at least one vent conduit, and the exterior side wall and the interior side wall being spaced apart to define a wall air gap, the vent conduit extending into the wall air gap and terminating in an outlet opening, the vent conduit directed through the foundation wall terminating in an inlet opening;

an axle rotatably mounted between the exterior side wall and the interior side wall;

at least one closure plate positioned within the exterior side wall and the interior side wall, the closure plate being mounted to the axle;

a cable extending through the cable apertures in the wall studs, the cable being coupled to the closure plate in an offset position relative to the axle, with a first end of the cable being secured to a portion of the dwelling, whereby a tensioning of the cable will effect rotation of the closure plates to regulate a flow of air between the exterior side wall and the interior side wall.

5,487,248

STRUCTURAL PANEL

Richard F. Artzer, 27261 Via Capri, San Juan Capistrano, Calif. 92675

Filed Nov. 22, 1993, Ser. No. 155,526

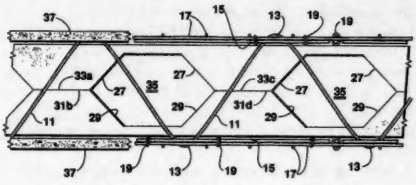
Int. Cl.[6] E04C *2/26*

U.S. Cl. 52—309.12 **7 Claims**

1. A structural panel comprising:

a plurality of contiguous elongated filled members;

each of said filler members formed of a foamed, resinous material;



each of said filler members having a top surface, a bottom surface, a pair of end surfaces, an outer surface and an inner surface;

said inner surface having slanted portions thereof intermediate flat portions thereof which flat portions are parallel to said outer surface;

mutually contiguous filler members having adjacent top and bottom surfaces and said flat portions of said inner surfaces thereof pressed against one another in vapor tight face-to-face contact whereby said slanted portions of the inner surfaces of adjacent filler members are spaced apart thereby to form chambers in said structural panel;

lattice structures interposed between and pressed into said adjacent top and bottom surfaces of said mutually contiguous filler members;

each of said lattice structures including an elongated filament wire having a zigzag configuration and a pair of substantially parallel end rods;

said elongated filament wire including a plurality of apices formed by said zigzag configuration;

said plurality of apices projecting slightly beyond each of said side surfaces of said filler members;

said end rods joined to said elongated filament wire between said apices and close to said outer surfaces of said filler member;

a wire mesh comprising lateral and longitudinal wires attached together at the intersections thereof; and

a plurality of C-clips connected to said end rods and to said wire mesh thereby to hold said wire mesh close to said lattice structures and maintain said filler members pressed together in a unitary panel.

5,487,249

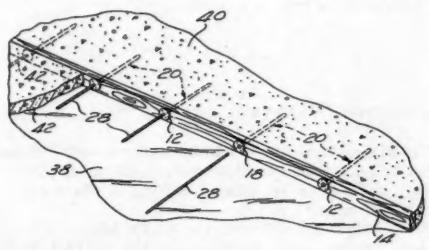
DOWEL PLACEMENT APPARATUS FOR MONOLITHIC CONCRETE POUR AND METHOD OF USE

Ronald D. Shaw, 1988 Pelican, Costa Mesa, Calif. 92626, and Lee A. Shaw, 1924 Irvine Ave., Newport Beach, Calif. 92660

Filed Mar. 28, 1994, Ser. No. 219,137

Int. Cl.[6] E04B *1/62*

U.S. Cl. 52—396.02 **12 Claims**



1. A concrete dowel placement apparatus attached to a concrete form which has an aperture therethrough, comprising:

a base member rigidly attachable to the concrete form, said base member comprising:

(a) an elongate, tubular sleeve portion for insertion through the aperture of the concrete form having opposed first and second ends, an outer surface and an inner surface defining a bore extending longitudinally through the sleeve portion; and

(b) a flange portion formed about and extending outwardly from the first end of the sleeve portion and being engaged to the concrete form after the insertion of said sleeve portion through the aperture of the concrete form;

an elongate, tubular dowel receiving sheath attached to said base member and defining an open proximal end, a closed distal end, and a longitudinally extending interior compartment;

the attachment of the sheath to the base member being facilitated by the slidable insertion of the sheath into the bore in a manner wherein the distal end of the sheath. protrudes from the second end of the sleeve portion and the proximal end of the sheath is substantially flush with the flange portion.

5,487,250

PREDECORATED WALLBOARD JOINT AND METHOD OF JOINING PREDECORATED WALLBOARDS TO FORM A CONCEALED JOINT

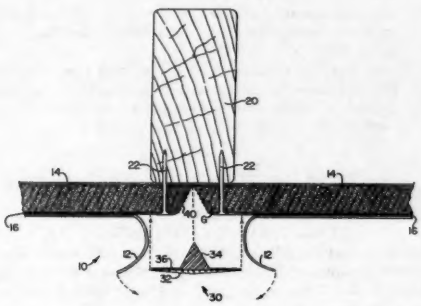
Patty L. Yount, Lexington, and Jacob E. Fisher, Jr., Granite Quarry, both of N.C., assignors to J. P. Walls, Inc., Lexington, N.C.

Continuation of Ser. No. 859,472, Jun. 12, 1992, Pat. No. 5,311,717, which is a continuation-in-part of Ser. No. 452,763, Dec. 14, 1989. This application Feb. 22, 1994, Ser. No. 199,565

The portion of the term of this patent subsequent to May 17, 2011, has been disclaimed.

Int. Cl.[6] E04B *2/10*

U.S. Cl. 52—417 **12 Claims**



1. A predecorated wall comprising:

adjacent predecorated wallboards having preformed edge portions forming a joint (J) therebetween, said wallboards of the type each having a predecorated sheet adhered to the major central portion of the outward face of the undecorated wallboard wherein the predecorated sheet is not adhered adjacent to the preformed side edges of said wallboard and extends beyond the preformed side edges thereof to form edge flaps;

said joint (J) forming a groove (G) provided within the preformed edges of said adjacent wallboards along at least a substantial portion of the length of the joint formed therebetween;

a joint strip comprising a support strip which extends laterally over at least a portion of the undecorated wallboard adjacent to the preformed side edge of each of said adjacent wallboards and a rib along the length thereof adapted to matingly fit within said groove and said support strip and said rib being adhesively secured thereto; and

a smooth seam formed over said joint strip by said flaps having been suitably double-cut and adhesively secured thereto.

5,487,251

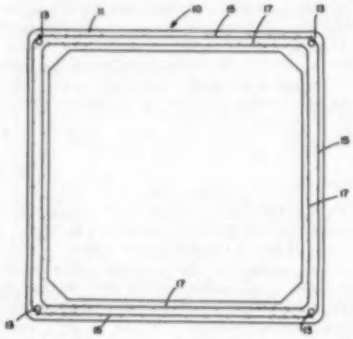
APPARATUS AND METHOD FOR REINFORCING CAST STRUCTURES

Wilbur E. Tolliver, Rockford, and Larry R. Magnuson, Muskegon, both of Mich., assignors to Independent Concrete Pipe, Mishiwaka, Ind.

Filed May 6, 1994, Ser. No. 238,952

Int. Cl.[5] E21D *11/10*

U.S. Cl. 52—600 **44 Claims**



27. A reinforced concrete structure comprising:

a reinforcing cage including:

a plurality of longitudinal registration tubes at predetermined locations around said reinforcing cage;

an outer reinforcing cage surrounding each of said registration tubes;

an inner reinforcing cage substantially coaxially positioned relative to said outer reinforcing cage;

at least one separator fastened between said outer and said inner reinforcing cages for controllably separating said cages; and

a cast concrete tube encapsulating said reinforcing cages in the walls thereof, said concrete tube having end surfaces substantially flush with the ends of said registration tubes exposing the ends of said registration tubes.

5,487,252

COIN WRAPPING MACHINE

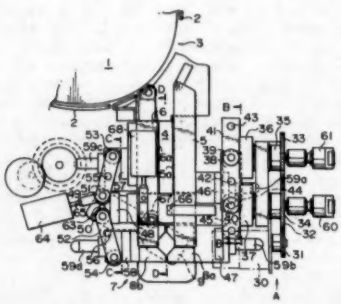
Masamichi Ozeki, Ashikaga; Mamoru Takasaki, Kazo; Katsuyuki Miyamoto, Kawaguchi, and Mitsumasa Tsuruda, Oomiya, all of, Japan, assignors to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1994, Ser. No. 218,930

Claims priority, application Japan, Apr. 15, 1993, 5-088699

Int. Cl.[6] B65B *11/04*

U.S. Cl. 53—212 **23 Claims**



1. A coin wrapping machine for wrapping a stack of a first predetermined number of coins comprising:

a rotatable disk for receiving deposited coins and feeding out said received coins to a coin sorting passage by a centrifugal force produced by rotation thereof, said coin sorting passage passing coins of a predetermined denomination only therethrough;

sensor means provided in said coin sorting passage for detecting coins;

coin stacking means having a height for stacking at most a second predetermined number of coins smaller than said first predetermined number of coins corresponding to a total number of coins to be wrapped in a wrapped coin roll;

coin support post means for receiving and supporting on an upper surface of said coin support post means coins stacked in said coin stacking means when at a post waiting position immediately below said coin stacking means;

coin wrapping means including a plurality of wrapping rollers, said coin wrapping means for winding a wrapping film around said stacked coins supported by said coin support post means, thereby wrapping said stacked coins and producing said wrapped coin roll;

support post moving means for moving said coin support post means between said post waiting position immediately below said coin stacking means, a post wrapping position where said stacked coins supported by said coin support post means can be wrapped by said coin wrapping means and a post retracted position where said coin support post means is retracted from said plurality of wrapping rollers;

first wrapping roller moving means for moving said plurality of wrapping rollers between respective wrapping roller wrapping positions where coins are wrapped and respective wrapping roller waiting positions where said plurality of wrapping rollers are slightly more apart from each other than when said plurality of wrapping rollers are in said respective wrapping roller wrapping positions; and

mode selecting means for selecting a counting mode which causes said coin wrapping machine to operate in one of a counting mode wherein said coin wrapping machine only counts coins and a wrapping mode wherein said coin wrapping machine counts and wraps coins;

wherein when said wrapping mode is selected using said mode selecting means, said support post moving means lowers said coin support post means by a distance corresponding substantially to a thickness of one coin of said predetermined denomination each time said coin support post means receives a coin during a time period between a first time when said coin stacking means has stacked said second predetermined number of coins smaller than said first predetermined number of coins corresponding to said total number of coins to be wrapped in each said wrapped coin roll, and a second time when said coin support post means supports said stacked coins in said first predetermined number corresponding to said total number of coins to be wrapped.

5,487,253

DEVICE FOR CONVEYING AND PROCESSING PACKS FOR LIQUIDS

Uwe Hieltscher, Bensheim; Udo Liebram, Pfungstadt; Wilhelm Reil, Bensheim, and Peter Sattler, Zwingenberg, all of, Germany, assignors to Tetra Laval Holdings & Finance S.A., Pully, Switzerland

Filed Apr. 25, 1994, Ser. No. 231,688

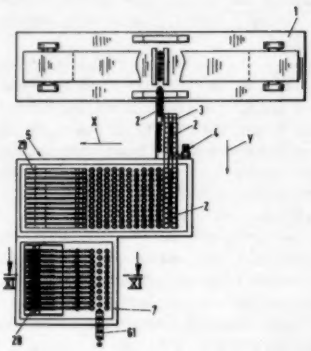
Claims priority, application Germany, Apr. 23, 1993, 43 13 325.8

Int. Cl.[6] B65B *3/00;43/00;* **B67B** *3/20*

U.S. Cl. 53—281 **11 Claims**

1. A device for conveying and processing packs for liquids, comprising:

a feed conveyer;



a plurality of processing stations, including processing stations for filling and closing of the packs, arranged sequentially, the feed conveyor being arranged for feeding packs to the processing stations;

a removal conveyer being arranged for removing processed packs from the device;

a first main conveyer device, the first main conveyer device being a one-step vertical conveyer device and having at least one vertically movable bridge with at least one horizontally arranged support rod for transporting a plurality of packs simultaneously; and

a second main conveyer device, the second main conveyer device being a one-step horizontal displacement device,

the first and the second main conveyer devices have a common conveyance position at a bottom one of two conveyance positions of the first main conveyer device, the processing stations for filling and closing of the packs are arranged vertically above the first and the second main conveyer devices (**6**, **9**), and the support rod is of sufficient length to transport a plurality of packs arranged in a row relative to one another.

5,487,254

APPARATUS FOR INSERTING MATERIAL INTO ENVELOPES

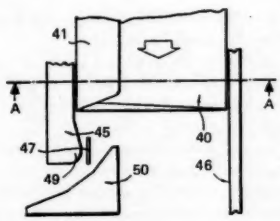
David M. Dronsfield, Loughton, Great Britain, assignor to Printed forms Equipment Limited, Loughton, Great Britain

Division of Ser. No. 915,694, Jul. 24, 1992, Pat. No. 5,327,701. This application Jan. 7, 1994, Ser. No. 178,987

Claims priority, application United Kingdom, Jan. 25, 1990, 9001758

Int. Cl.[6] B65B *43/38*

U.S. Cl. 53—381.7 **7 Claims**



1. An apparatus for opening envelopes, each envelope having a flap portion folded on a fold line to overlie a main portion of said envelope, said apparatus comprising:

a conveyor adapted to convey said envelopes along a conveyor path with said fold lines parallel to the direction of movement of said conveyor,

means on said conveyor path adapted to distort each envelope so that said flap portion thereof is hinged upwardly from said main portion thereof, said distortion means comprising a projection extending adjacent said fold lines of said envelopes, a first guide member restraining upward movement of said envelopes at said fold line, and a second guide member restraining lateral movement of said envelopes away from said first guide member, and

means downstream of said distorting means on said conveyor path and adapted to enter between said flap portion and said main portion of each envelope to bring said flap portion and said main portion substantially into co-planar alignment.

5,487,255

BALE, AN APPARATUS AND A METHOD FOR THE WRAPPING OF A BALE IN TWO CROSSING WRAPPING LAYERS APPLIED IN OVERLAPPING HELICAL TURNS

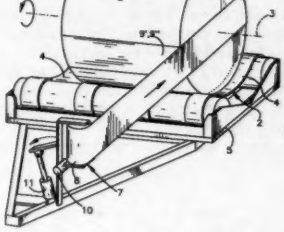
Staffan Söderberg, Hälleby Gård, Hölö S-150 16, Sweden

Division of Ser. No. 129,114, Oct. 25, 1993. This application Feb. 24, 1995, Ser. No. 394,306

Claims priority, application Sweden, Apr. 8, 1991, 9101032

Int. Cl.[6] B65B *13/02*

U.S. Cl. 53—399 **20 Claims**



1. A method for wrapping a bale of organic material, such as animal-feed for ensiling, straw or hay, in bands of plastic packaging film, said bale having a first axis and a second axis, said first axis being generally longitudinally directed and said second axis being generally transverse to said first axis, comprising the steps of:

dispensing plastic packaging film from a packaging film supply roll spaced from the bale while maintaining the plastic film under tension,

wrapping the packaging film around the bale in successive turns with the packaging film supply roll being in an orientation generally transverse to said first axis, the film in each turn around the bale having first turn parts which extend generally parallel with said first axis and second turn parts which extend transversely to said first axis,

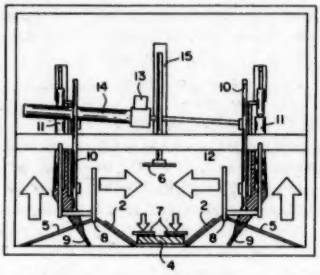
dispensing further film material from a film material supply roll spaced from the bale while maintaining the further film material under tension,

wrapping the bale (**1**) with further film material (**9**) with the film material supply roll being in an orientation generally parallel to said first axis, while maintaining the further film material under tension, such that successive film turns (**9"**) of said further film material will cross-over the first turn parts (**9'"**) of the packaging film which extend generally parallel to said first axis (**3**) in an elastically tensioned and wrapper retaining fashion.

5,487,256
PACKAGING METHOD FOR WRAPPING BOOKS OR THE LIKE

Veikko Janhonen, Helsinki, Finland, assignor to Pussikesku Oy, Helsinki, Finland

Continuation of Ser. No. 253,957, Jun. 3, 1994, Pat. No. 5,410,862. This application Jan. 12, 1995, Ser. No. 372,059
Claims priority, application Finland, Jun. 14, 1993, 932730
Int. Cl.[6] B65B *11/00*
U.S. Cl. 53—461 **16 Claims**

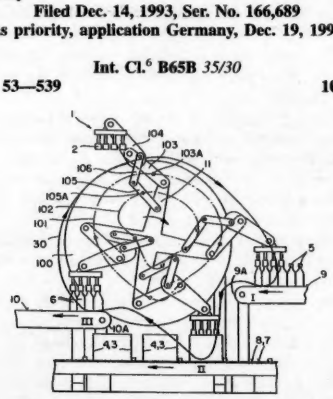


1. A method for wrapping an object comprising:
supporting a cardboard piece having opposite sides on a conveyor having a wrapping station, at least one pair of elongated belts extending transverse to the conveyor, one belt on either side of the conveyor, and a pair of guides, one guide on each side of the conveyor, each guide movably supporting one of the belts;
engaging a press element with an object on the cardboard piece to hold the object and cardboard piece against the conveyor;
folding the cardboard piece at the wrapping station by moving the guides upwardly, then toward one another, then alternately downwardly such that the belts fold sections of the cardboard piece first upwardly then alternately on top of one another in overlapping fashion; and
disengaging the press element from the object during said folding.

5,487,257
PACKING AND UNPACKING MACHINE

Bernhard Domeier, Pentling, and Dieter Rumm, Schwandorf, both of, Germany, assignors to Krones AG, Neutraubling, Germany

Filed Dec. 14, 1993, Ser. No. 166,689
Claims priority, application Germany, Dec. 19, 1992, 42 43 008.9
Int. Cl.[6] B65B *35/30*
U.S. Cl. 53—539 **10 Claims**



1. Apparatus for removing first articles from boxes and for inserting second articles into boxes continuously, comprising:

A box conveyor for conveying a first stream of boxes containing first articles and a second, parallel stream of boxes which are empty,

a machine arranged proximate to the box conveyor and comprised of plural article handling heads connected to the machine and transported continuously in a closed loop path through working stations with the heads extending laterally over said box conveyor, said heads having gripping elements individually controllable to grip and release articles,

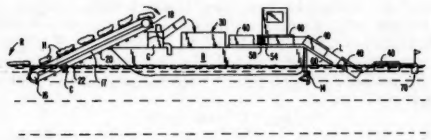
an article infeed conveyor providing second articles to a first working station along the path of the continuously moving heads where gripping elements of a head are controlled to grip the second articles and hold the second articles while the head is continuously moved to a second working station where said gripping elements are controlled to release the second articles into an empty box in the second stream of boxes and other of the gripping elements on the head are controlled to concurrently grip and withdraw first articles from a box in the first stream of boxes while the head is continuously moved to a third working station to carry said first articles above the box conveyor and allow the resulting empty box in the first stream and the box in which the second articles were inserted in the second stream to be conveyed together on the box conveyor, and

an outfeed conveyor at said third working station to which the first articles that are withdrawn from a box at the second working station are carried by the gripping elements of the head and are released onto the outfeed conveyor for being conveyed, away from the machine.

5,487,258
WATER HYACINTH REMOVAL APPARATUS AND METHOD

Thomas J. McNabb, 1115 Silverhill Ct., Lafayette, Calif. 94549

Continuation-in-part of Ser. No. 238,103, May 4, 1994, abandoned. This application Nov. 30, 1994, Ser. No. 347,766
Int. Cl.[6] A61D *45/08*
U.S. Cl. 56—9 **14 Claims**



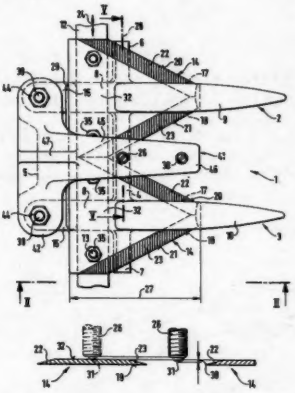
1. Apparatus for the removal of water hyacinths growing from a floating disposition on water comprising:
a hull for water borne support of said apparatus;
a conveyor support on said hull having a first end submerged, a second end elevated to level of said barge, and a discharge adjacent said second end;
means for moving said conveyor to convey water hyacinths from said submerged end to said discharge end;
a grinder supported on said hull and positioned at said discharge end of said conveyor, said grinder for receiving whole water hyacinth and causing severance of said water hyacinth from a unitary plant to a fibrous state wherein said plant constitute a fibrous mass with leaf and stalk matter shredded; and,
a baler supported on said hull for receiving and baling said fibrous mass with said leaf and stalk and compacting said fibrous leaf and stalk mass into bales.

5,487,259

CUTTER ASSEMBLY FOR MOWING APPARATUS

Robert L. Powers, Easton, Ill., and Adolf Ibach, Remscheid, Germany, assignors to Carl Sulberg GmbH & Co., Remscheid, Germany

Filed Nov. 30, 1994, Ser. No. 347,039
Int. Cl.[6] A01D *34/17*
U.S. Cl. 56—298 16 Claims



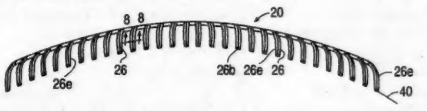
1. A cutter assembly for mowing apparatus comprising:
a plurality of sickle guards arranged side by side;
each sickle guard having at least one guard;
each guard having a guard body and being releasably fixed at least with its guard body to a cutter bar;
a ledger surface on each guard body having lateral guard body cutting edges;
knife sections secured to a reciprocable knife back, each knife section having a bottom face, facing said ledger surface, and lateral facets terminating in knife section cutting edges;
rigid hold-down arms fixedly mounted to said cutter bar spaced from each other in the longitudinal direction of said cutter bar;
each hold-down arm having a front part extending above upper faces of said knife sections;
said front part having at least one hold-down element for holding down said knife sections in the direction towards the ledger surface of said guard body, said hold-down element being movable into contact with said knife section upper faces; and
said knife section cutting edges lying in said knife section bottom faces.

5,487,260

LAWN RAKE

Mark Proffitt, Greeneville, Tenn., assignor to DeJay Corporation, Palm Beach Gardens, Fla.

Filed Sep. 26, 1994, Ser. No. 317,616
Int. Cl.[6] A01D *7/06*
U.S. Cl. 56—400.04 19 Claims



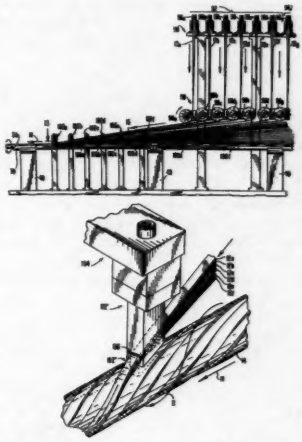
3. A rake head, comprising:
a socket portion having a recess adapted for receiving a rake handle;
a hub portion having a first end attached to said socket portion, a second end, an upper surface, and a lower surface, with a clip member extending from said upper surface, intermediate said hub portion first end and said hub portion second end, and with an opening through said hub portion beneath said clip member, said clip member and the opening cooperating with said upper surface to permit clipping of items onto said rake head to retain the items with said rake head; and
a plurality of tines extending from said second end of said hub portion.

5,487,261

METHOD AND APPARATUS FOR APPLYING FLAT RIBBONS ABOUT A CYLINDRICAL CORE

Andre Varga, Willowdale, Canada, assignor to Ceeco Machinery Manufacturing Ltd., Ontario, Canada

Continuation-in-part of Ser. No. 946,270, Sep. 16, 1992, Pat. No. 5,331,796. This application Jan. 28, 1994, Ser. No. 188,087
Int. Cl.[6] D01H *13/04*
U.S. Cl. 57—9 44 Claims



1. Apparatus for helically winding a plurality of flat filaments about a cylindrical core comprising first supply means for supplying a rotating central core having a cylindrical surface for longitudinal movement substantially along a machine axis of the apparatus; second supply means substantially fixed relative to the direction of said machine axis for supplying a plurality of flat filaments to be helically wound about the cylindrical surface of the core; at least one winding station downstream of said first supply means and arranged substantially along said machine axis; and guide means for guiding each of a plurality of filaments along a feed direction that defines an acute angle with said machine axis which substantially corresponds to a desired lay angle of the filaments about the core, each of said filaments being drawn along said feed direction by the rotating core for substantially tangential application of the filaments about the core at said winding station.

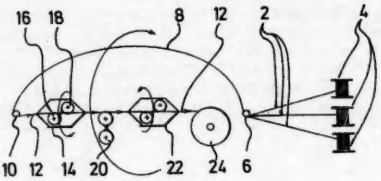
5,487,262

METHOD AND DEVICE FOR OVERTWISTING AND UNDERTWISTING A STEEL CORD

Johan De Waegenaere, Zwevegem; Luc Sabbe, Deerlijk, and Frans Van Giel, Wevelgem, all of, Belgium, assignors to N.V. Bekaert S.A., Zwevegem, Belgium

Filed Apr. 7, 1994, Ser. No. 224,555
Claims priority, application European Pat. Off., Apr. 20, 1993, 93201130
Int. Cl.[6] D01H *7/86;13/26*
U.S. Cl. 57—58.65 17 Claims

1. A process of treatment of a steel cord adapted for the reinforcement of rubber products, said steel cord comprising steel



filaments which have been twisted to a final twist pitch, said process comprising the steps of:

(i) plastically deforming the steel filaments by overtwisting the steel cord to a twist pitch which is smaller than the final twist pitch;

(ii) untwisting the steel cord to the final twist pitch;

(iii) further untwisting the steel cord to a twist pitch which is greater than the final twist pitch; and

(iv) twisting the steel cord again to the final twist pitch,

wherein steps (i) and (ii) are done under a first tension and steps (iii) and (iv) are done under a second tension, the second tension being lower than half of the first tension.

5,487,263

DEVICE FOR ADJUSTING CAPSULE THREAD BRAKES IN TWISTING MACHINES, IN PARTICULAR TWO-FOR-ONE TWISTERS

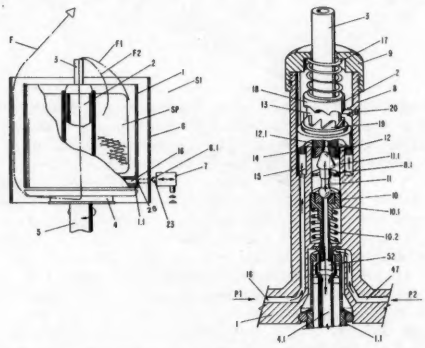
Heinz Scheufeld, Korschenbroich; Ulrich Lossa, Krefeld, and Heinz Stenmans, Grefrath, all of, Germany, assignors to Palitex Project-Company GmbH, Krefeld, Germany

Filed Apr. 13, 1994, Ser. No. 226,959

Claims priority, application Germany, Apr. 13, 1994, 43 11 999.9

Int. Cl.[6] D01H *1/10;7/86*

U.S. Cl. 57—58.86 **16 Claims**



1. A device for adjusting the braking power of capsule thread brakes of spindles of at least one twisting machine, said device comprising:

a plurality of twisting spindles each having a bobbin carrier with a hub and a capsule thread brake with a step-wise adjustable braking power positioned in said hub, said capsule thread brake having a longitudinal center axis defining an axial direction of said capsule thread brake and comprising:

a) two brake rings arranged axially spaced from one another,

b) a brake cartridge supported between said two brake rings, wherein the braking power is adjusted by axially displacing and rotating one of said brake rings, thereby changing a distance between said brake rings and thus a force of said brake rings acting on said brake cartridge, and

c) a pressure cylinder acting on one of said brake rings;

a common compressed air supply line for supplying compressed air, said compressed air supply line having a control device;

a connector connected to each said spindle, wherein said compressed air supply line communicates via said connectors with said pressure cylinders, wherein said control device supplies compressed air pulses through said common compressed air supply line and said connectors to said pressure cylinders to affect simultaneously an axial displacement by a predetermined distance of one of said brake rings of all said capsule thread brakes.

5,487,264

HOLLOW DIAMOND CUT ROPE CHAIN

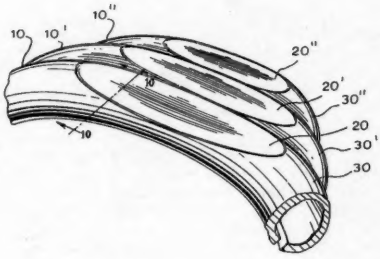
Kalman Strobel, New York, N.Y., assignor to OroAmerica, Inc., Burbank, Calif.

Continuation of Ser. No. 792,291, Nov. 14, 1991, Pat. No. 5,129,220. This application Jun. 24, 1992, Ser. No. 905,073

The portion of the term of this patent subsequent to Jul. 14, 2009, has been disclaimed.

Int. Cl.[6] B21L *5/02*

U.S. Cl. 59—80 **11 Claims**



1. A jewelry rope chain made of a number of intertwined links resembling a rope, comprising:

a plurality of segmented hollow links, said links having a annular configuration interrupted by an inner gap extending along an inner circumference of said hollow links,

said hollow links having an outside exterior circumferential surface and an inside interior circumferential surface,

each of said hollow links having an outer surface wall portion generally curved in cross section which is spaced apart from, and has a center opposite, said inner gap, and,

each of said hollow links having further at least one flattened portion on said outside exterior circumferential surface of said curved outer wall portion, said at least one flattened portion on said outside exterior circumferential surface of said curved outer wall portion extending inwardly toward said inner gap with respect to said outer surface wall portion.

5,487,265

GAS TURBINE COORDINATED FUEL-AIR CONTROL METHOD AND APPARATUS THEREFOR

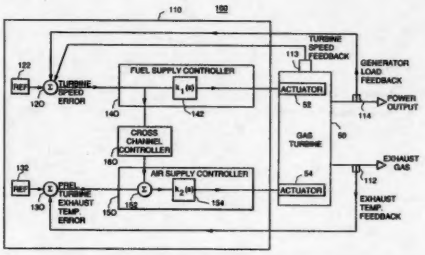
Ravi Rajamani, Schenectady; Karl D. Minto, Ballston Lake, both of N.Y.; Benjamin E. Bulkley, Erie, Pa., and Bruce G. Norman, Charlton, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 2, 1994, Ser. No. 236,972

Int. Cl.[6] F02C *9/50*

U.S. Cl. 60—39.03 **16 Claims**

1. A method for operating a gas turbine so as to reduce undesirable emissions and acoustic pressure oscillations, the method comprising the step of coordinating the modulation of respective turbine fuel supply and air supply signals so as to maintain the fuel-air ratio of the fuel air combustible mixture supplied to the turbine substantially constant over loaded operating conditions of said gas turbine in which both fuel and air supply to said turbine is



modulated, coordinating the modulation of turbine fuel supply and air supply further comprising the steps of:

generating a turbine speed error signal by comparing actual turbine speed with a selected turbine reference speed;

generating a preliminary turbine exhaust temperature error signal by comparing actual turbine exhaust temperature with a selected turbine exhaust reference temperature;

producing a turbine fuel supply control signal in correspondence with said speed error signal;

generating a coordinated turbine exhaust temperature error signal by modifying said preliminary turbine exhaust temperature error signal in correspondence with a temperature error modification signal, said temperature error modification signal being processed from said turbine speed error signal with a time delay transfer function; and

producing a turbine air supply signal from said coordinated turbine exhaust temperature error signal;

said coordinated turbine exhaust temperature error signal providing coordination between said turbine fuel supply signal and said turbine air supply signal so as to maintain the fuel-air mixture in said gas turbine substantially constant.

5,487,266

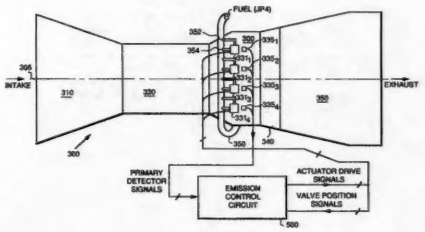
COMBUSTION CONTROL FOR PRODUCING LOW NO_x EMISSIONS THROUGH USE OF FLAME SPECTROSCOPY

Dale M. Brown, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 47,936, Apr. 19, 1993, Pat. No. 5,303,684, which is a division of Ser. No. 878,933, May 5, 1992, Pat. No. 5,257,496. This application Apr. 12, 1994, Ser. No. 226,528

Int. Cl.[6] F02C *9/28*

U.S. Cl. 60—39.06 **22 Claims**



1. Apparatus for detecting combustion flames and reducing nitrogen oxide (NO_x) exhaust emissions resulting from combustion of a mixture of hydrocarbon fuel and air within a gas turbine without undue risk of flame-out comprising:

means for detecting and measuring intensity of a band of ultraviolet spectral lines emanating from a combustion flame in said turbine;

means for converting the measured intensity value of said predetermined band of ultraviolet spectral lines into a corresponding value of a turbine operating parameter, said parameter being either temperature of said flame or NO_x concentration in said exhaust emissions; and

means for dynamically adjusting the fuel/air mixture for said turbine such that the value of said turbine operating parameter remains below a predetermined limit.

5,487,267

SUPPRESSION OF INFRARED RADIATION EMISSIONS FROM JET ENGINES

Henry E. Alquist, and Robert M. Schirmer, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 7, 1972, Ser. No. 216,024

Int. Cl.[6] C06D *5/06*

U.S. Cl. 60—206 **8 Claims**

1. In the operation of a turbojet engine, a method of suppressing infrared radiation comprising introducing into said engine a fuel mixture of a low molecular weight monohydric alcohol and conventional hydrocarbon fuel in proportion so the luminometer number of the blend is in the range of about 200 to about 600.

5,487,268

CATALYST FOR PURIFYING EXHAUST GAS AND METHOD OF PURIFYING EXHAUST GAS

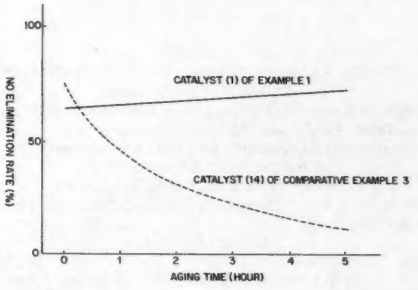
Takashi Itoh, and Yukio Kosaki, both of Ichikawa, Japan, assignors to N.E. Chemcat Corporation, Tokyo, Japan

Division of Ser. No. 953,879, Sep. 30, 1992, Pat. No. 5,326,735. This application Mar. 28, 1994, Ser. No. 218,238

Claims priority, application Japan, Jul. 10, 1992, 4-207502

Int. Cl.[6] F01N *3/20*

U.S. Cl. 60—274 **2 Claims**



1. A method of purifying exhaust gas from a lean burn gasoline engine or diesel engine having an air/fuel ratio of 17 or over, comprising the step of bringing the catalyst comprising an iridium supported on one carrier selected from the group consisting of metal carbides and metal nitrides, into contact with said exhaust gas at a temperature of 250° C. to 850° C.

5,487,269

METHOD FOR MONITORING THE EFFICIENCY OF A CATALYTIC CONVERTER FOR TREATING EXHAUST GASES FROM AN INTERNAL COMBUSTION ENGINE

Alain A. Atanasyan, Tournefeuille, and Francis Tarroux, Portet S/Garonne, both of, France, assignors to Siemens Automotive S.A., Toulouse Cedex, France

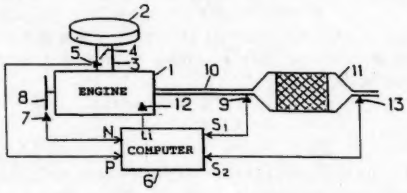
PCT No. PCT/EP92/02303, § 371 Date Jun. 22, 1994, § 102(e) Date Jun. 22, 1994, PCT Pub. No. WO93/09335, PCT Pub. Date May 13, 1993

PCT Filed Oct. 6, 1992, Ser. No. 232,228

Claims priority, application France, Jan. 28, 1991, 91 13237

Int. Cl.[6] F01N *3/20*

U.S. Cl. 60—274 **6 Claims**



1. A method for monitoring the efficiency of a catalytic converter for treating exhaust gases from an internal combustion engine, wherein the engine is equipped with at least one fuel injector and a device for regulating an engine inlet air/fuel mixture and an opening time of the fuel injector, the method which comprises:

a) disposing an oxygen probe in a gas flow leaving a catalytic converter, wherein the oxygen probe provides an output signal which switches between two levels;

b) measuring an injector opening time suitable for ensuring stoichiometry of an air/fuel mixture during regulation and at substantially stabilised speed, and choosing a base injection time from the measured injector opening time;

c) subsequently, during a predetermined time interval, imposing on the opening time a time variation of symmetric deviation having a predetermined amplitude and shape about the base injection time;

d) progressively and monotonically modifying the base opening time during successive time intervals, so as to pass through a centering of the deviation of the opening time on that of an oxygen storage capacity of the catalytic converter; and

e) evaluating an efficiency of the catalytic converter by determining the resulting oscillation of the output signal.

5,487,270

AIR-FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Yukihiro Yamashita, Kariya, Japan; Kenji Ikuta, Rolling Hills Estates, Calif., and Shigenori Isomura, Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 2, 1993, Ser. No. 85,378

Claims priority, application Japan, Jul. 3, 1992, 4-177227; Jul. 3, 1992, 4-177228; Jan. 30, 1992, 4-292503; Jan. 14, 1993, 5-005290

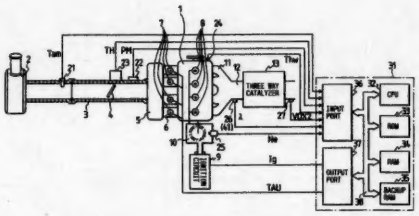
Int. Cl.[6] F01N *3/20*

U.S. Cl. 60—276 **24 Claims**

1. An air-fuel ratio control system for an internal combustion engine, comprising:

upstream air-fuel ratio detecting means, provided upstream of a catalytic converter in an exhaust passage of the engine, for detecting a first air-fuel ratio of an air-fuel mixture based on exhaust gas upstream of the catalytic converter;

downstream air-fuel ratio detecting means, provided downstream of the catalytic converter, for detecting a second air-fuel ratio of the air-fuel mixture based on the exhaust gas having passed through the catalytic converter;



inversion direction determining means for determining a direction of inversion of said second air-fuel ratio when said second air-fuel ratio has been inverted between rich and lean with respect to a given air-fuel ratio;

target air-fuel ratio setting means for correcting a target air-fuel ratio in a direction opposite to said direction of the inversion when determined by said inversion direction determining means, said target air-fuel ratio setting means correcting said target air-fuel ratio by a given skip amount in a skipped manner; and

fuel injection amount deriving means for deriving a fuel injection amount of a fuel injection valve at a given updating speed based on a differential between said first air-fuel ratio and said target air-fuel ratio.

5,487,271

BRAKE-BOOSTER WITH HYDRAULIC REACTION AND ADJUSTABLE KICK

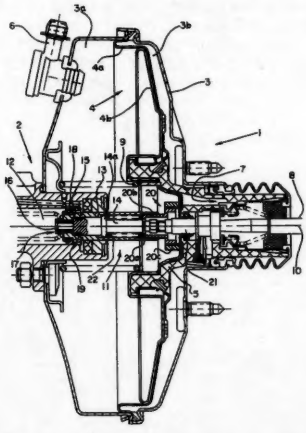
Jean Pierre Gautier; Ulysse Verbo, both of Aulnay-sous-Bois, and Miguel Perez Revilla, Argenteuil, all of, France, assignors to AlliedSignal Europe Services Techniques, Drancy, France

Filed Sep. 13, 1993, Ser. No. 117,148

Claims priority, application France, Sep. 30, 1992, 92 11624

Int. Cl.[6] B60T *13/20;* **F15B** *9/10*

U.S. Cl. 60—554 **4 Claims**



1. A brake-booster device for a motor vehicle, comprising a master cylinder having with a main hydraulic piston designed to receive an actuation force composed of an input force and of a boost force both acting in an axial direction, and a pneumatic booster controllable by application of said input force on a control rod controlling the opening of a valve, so as to exert said actuation force on the main hydraulic piston, the booster comprising a rigid casing separated in leaktight manner into two chambers by means at least of a movable partition capable of being acted upon by a

pressure differential between the two chambers resulting from the opening of the valve and of driving a pneumatic piston, movable with respect to the casing, bearing said valve and contributing at least to transmission of said boost force, characterized in that the main hydraulic piston of the master cylinder comprises a hollow, movable cylinder communicating with the master cylinder, receiving at least part of the boost force, and inside which slides, in leaktight manner and in the axial direction, a secondary hydraulic piston capable of receiving at least said input force, and in that resilient means, exerting an adjustable resilient force between said secondary hydraulic piston and said movable cylinder, is disposed inside the movable cylinder and pushes said secondary hydraulic piston in the direction of the master cylinder, the adjustment of said resilient force enabling adjustment of a non-zero minimal value of the actuation force.

5,487,272

CRYOGENIC REFRIGERATOR

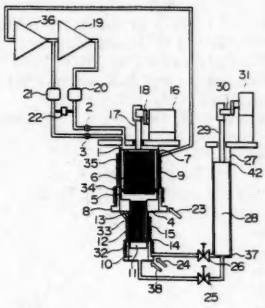
Masashi Nagao, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 39,816, Mar. 30, 1993. This application Oct. 21, 1994, Ser. No. 326,960

Claims priority, application Japan, Mar. 31, 1992, 4-76864; Mar. 17, 1993, 5-56817

Int. Cl.[6] F25B *9/00*

U.S. Cl. 62—6 **12 Claims**



1. A cryogenic refrigerator comprising: a first compressor; a first expander having at least one accumulator using an accumulating material comprising a rare earth alloy or compound which has a large specific heat at 10 K. or below or an accumulating material comprising helium; a second expander which effects further expansion of a working fluid partially and directly introduced thereto from an expansion space of the first expander; at least one heat exchanger which performs heat exchange between the working fluid expanded at second expander and said first expander; and a second compressor which compresses the working fluid.

5,487,273

TURBOCHARGER HAVING PNEUMATIC ACTUATOR WITH PILOT VALVE

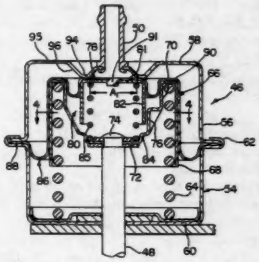
David G. Elpern, Los Angeles, and James E. T. Blake, Rancho Palos Verdes, both of Calif., assignors to AlliedSignal Inc., Morristown, N.J.

Filed Sep. 13, 1993, Ser. No. 120,610

Int. Cl.[6] F02D *23/00;* **F16K** *31/126*

U.S. Cl. 60—602 **20 Claims**

1. Exhaust gas driven turbocharger comprising a compressor housing, a turbine housing, and a center housing supporting the turbine housing on one end thereof and the compressor housing on the other end thereof, a shaft supported for rotation within said center housing, one end of the shaft extending into said compressor housing and supporting a compressor wheel for rotation relative to



the compressor housing, the other end of said shaft extending into said turbine housing and supporting a turbine wheel for rotation relative to said turbine housing, said turbine housing including means for directing engine exhaust gases through the turbine wheel to effect rotation of the shaft, said compressor housing including means for directing air through a compressor inlet and then to said compressor wheel for compression thereby to generate boost air and for directing boost air out of said compressor housing through an outlet, said turbine housing including a mechanically actuated device operable to limit the pressure of the boost air, and a pressure operated actuator responsive to the pressure level of the boost air for operating said mechanically actuated device, said actuator including a housing having an axis, a circumferentially extending wall circumscribing the axis, and an actuator inlet communicated with said boost air, an actuator piston responsive to the pressure level communicated into said housing through the actuator inlet, linkage means connecting the actuator piston with said mechanically actuated device, and a pilot piston slidably mounted within said housing for closing said actuator inlet until the pressure level of the boost air attains a predetermined level wherein each of said pistons includes a fluid pressure responsive surface, and a diaphragm having a peripheral portion secured to said circumferentially extending wall of the actuator housing and extending across the fluid pressure responsive surfaces of both pistons, and means securing the diaphragm to said pilot position.

5,487,274

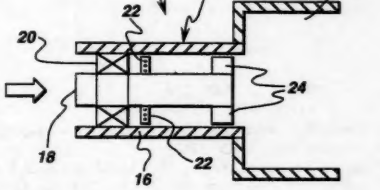
SCREECH SUPPRESSOR FOR ADVANCED LOW EMISSIONS GAS TURBINE COMBUSTOR

Anil Gulati, Albany; Richard E. Warren, Jr., Schenectady, and Eayre B. Voorhees, Sloansville, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 555,583, May 3, 1993, abandoned. This application Apr. 8, 1994, Ser. No. 225,489

Int. Cl.[6] F02C *7/24*

U.S. Cl. 60—725 **14 Claims**



1. A combustor comprising:

a main combustion chamber;

at least one premixer section attached to said main combustion chamber, said .premixer section including:

a cylindrical premixer tube joined in flow communication with said chamber;

a cylindrical centerbody disposed concentrically in said tube to define an annular flow channel therebetween having an inlet at one end and an exit at an opposite end thereof adjoining said chamber;

a swirler disposed in said channel inlet for receiving and swirling compressed air; and

fuel spokes disposed in said channel and downstream of said swirler for injecting fuel into said swirled air to form a fuel and air premix flowable through said channel to said exit and into said chamber; and

means for suppressing screech disposed in said premixer section, said means for suppressing screech comprising a plurality of separate, solid body screech suppression members, said screech suppression members being uniformly circumferentially spaced apart from each other at said channel exit, and extending radially between said centerbody and said tube for substantially an entire radial distance therebetween except for a gap formed at one radial end of each of said members for accommodating thermal expansion.

5,487,275

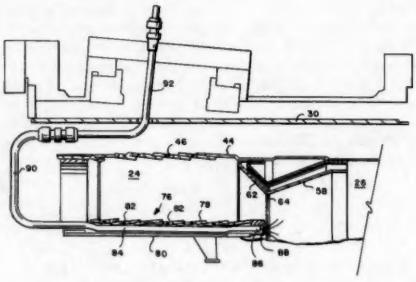
TERTIARY FUEL INJECTION SYSTEM FOR USE IN A DRY LOW NOX COMBUSTION SYSTEM

Richard J. Borkowicz, Westminster, Md.; L. Berkley Davis, Jr., Schenectady, and Masayoshi Kuwata, Ballston Lake, both of N.Y., assignors to General Electric Co., Schenectady, N.Y.

Filed Dec. 11, 1992, Ser. No. 987,957

Int. Cl.[6] F02C *3/14*

U.S. Cl. 60—747 **10 Claims**



1. An improved gas turbine combustor of the type including primary and secondary combustion chambers with a venturi including a throat portion located therebetween; a plurality of primary fuel injection nozzles secured to a combustor cap in an annular array upstream of the primary combustion chamber; and a centerbody including a secondary fuel nozzle, said centerbody extending from said combustor cap to said secondary combustion chamber; the improvement comprising a plurality of tertiary fuel injection nozzles arranged in a circular array about a longitudinal axis of the combustor, at a location downstream of said venturi throat portion, for injecting fuel into the secondary combustion chamber.

5,487,276

FOOD INVENTORY SYSTEM

Dianna Namisniak, and Lee Namisniak, both of 22592 Le Dana, Mission Viejo, Calif. 92691

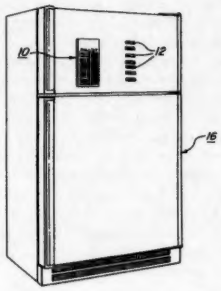
Continuation-in-part of Ser. No. 98,521, Jul. 28, 1993, Pat. No. 5,335,509. This application May 5, 1994, Ser. No. 239,981

The portion of the term of this patent subsequent to Aug. 9, 2011, has been disclaimed.

Int. Cl.[6] G09F *9/00*

U.S. Cl. 62—125 **24 Claims**

1. A device to ensure the consumption of an item of perishable food before the item has been held in a storage location beyond its useful storage lifetime, the device comprising:



a base unit, located near the storage location;

at least one numeric display on the base unit to display elapsed time;

cataloging means on the base unit for recording the name and storage lifetime of the item of food; and

means for activating the numerical display,

whereby the stored food item listed on the base unit may be safely consumed until the numeric display shows that the item has been stored beyond its useful lifetime.

5,487,277

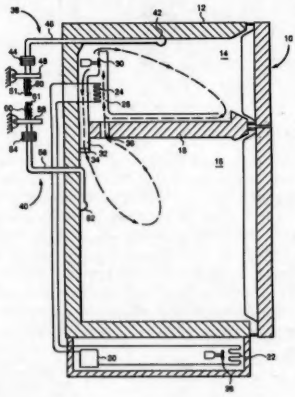
INDEPENDENT COMPARTMENT TEMPERATURE CONTROL IN A HOUSEHOLD REFRIGERATOR USING INTERLINKED THERMOSTATS

Warren F. Bessler, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 18, 1994, Ser. No. 342,291

Int. Cl.[6] F25D *17/08*

U.S. Cl. 62—187 **22 Claims**



1. A control for a refrigeration apparatus having first and second cooled compartments, a compressor and an evaporator fan, said control comprising:

a first thermostat having first and second states, said first thermostat changing from its first state to its second state when the temperature in said first compartment exceeds a predetermined level;

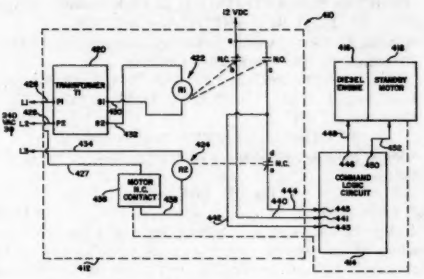
a second thermostat having first and second states, said second thermostat changing from its first state to its second state when the temperature in said second compartment exceeds a predetermined level; and

a locking mechanism situated between said first and second thermostats so that said first thermostat is prevented from changing from its second state to its first state whenever said second thermostat is in its second state.

5,487,278
BACK-UP SWITCHING SYSTEM FOR REFRIGERATOR TRUCKS

Jerry Hilleveld; William A. Martherus, both of Garden Grove, Calif., and Kenneth J. Hartman, Crystal Lake, Ill., assignors to Kenneth J. Hartman, Crystal Lake, Ill.

Filed May 6, 1994, Ser. No. 239,299
Int. Cl.[6] F25B *27/00*
U.S. Cl. 62—236 **6 Claims**



1. A back-up system for a refrigeration unit in a trailer and the like, said back-up system comprising in combination:

a compressor located in the trailer for operating the refrigeration unit;

a diesel engine operatively connected to said compressor;

a stand-by electric motor also operatively connected to said compressor for normally running said compressor when said trailer is parked;

first relay means operatively connected to a source of A/C voltage for generating a first signal when there is a power failure condition and for generating a second signal when there is no power failure;

second relay means also operatively connected to the source of A/C voltage and to normally-closed contact means of said standby motor and being responsive to said second signal for generating a third signal when there is a malfunction in said standby motor and there is no power failure;

command logic circuit means being responsive to either the first signal from said first relay means or the third signal from said second relay means for generating a diesel start signal;

said command logic circuit means being responsive to said second signal from said first relay means for generating a standby start signal;

said standby motor being responsive to said standby start signal for turning on the same in order to operate said compressor; and

said diesel engine being normally turned off when said trailer is parked and being responsive to said diesel start signal for turning on the same in order to operate said compressor.

5,487,279
HEAT EXCHANGER WITH INTEGRAL FILTER/DRIER CARTRIDGE

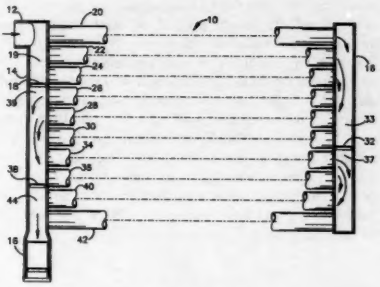
William N. Eybergen, Dutton, and Wayne K. Hutchison, Ingersoll, both of, Canada, assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 29, 1994, Ser. No. 315,044
Int. Cl.[6] F25B *43/00*
U.S. Cl. 62—474 **12 Claims**

1. An exothermic heat exchanger for a refrigeration system comprising:

(a) a plurality of conduits disposed in spaced generally parallel arrangement;

(b) a first and second manifold, each disposed for interconnecting common ends of said conduits for permitting flow therebetween;



(c) a tubular outlet formed in one of said first and second manifolds;

(d) one of said first and second manifolds defining integrally therewith a cartridge receiving cavity therein; and,

(e) a cartridge assembly received in said outlet, said cartridge assembly having:

(i) a header with an outlet port adapted for external conduit connection and a basket having the rim thereof attached to said header with the remote end thereof perforated;

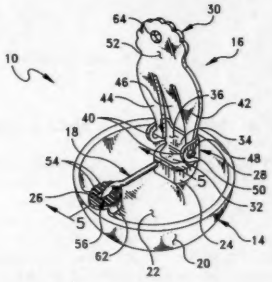
(ii) desiccant material disposed within said basket;

(iii) sealing means operative to seal said header in said outlet.

5,487,280
CONVERTIBLE EARRING

William D'Amore, Jr., West Warwick, R.I., assignor to Cotillion, Inc., West Warwick, R.I.

Filed Oct. 4, 1994, Ser. No. 318,907
Int. Cl.[6] A44C *7/00*
U.S. Cl. 63—12 **1 Claim**



1. An earring capable of being converted from a clip-on earring to a pierced earring and vice versa, said earring comprising:

an ornament having an outer periphery defining an inwardly facing surface which is adjacent an earlobe of a wearer when the earring is worn, said inwardly facing surface being concave so as to define a cavity;

a clamping assembly for clamping the earring on the earlobe of the wearer, said clamping assembly being pivotally attached to the inwardly facing concave surface of the ornament at a first point adjacent the periphery thereof, and comprising a clip portion pivotally movable between an open position and an earlobe clamping position in which the earlobe of the wearer is positioned between the clip portion and the inwardly facing surface of the ornament, and spring means for biasing the clip portion toward the ornament when the clip portion is in its earlobe clamping position for providing a clamping force so that the earring remains attached to the earlobe when worn;

an earlobe engaging member mounted on said inwardly facing concave surface at a second point adjacent the periphery of

said ornament generally diametrically opposed to said first point, with the major portion of said engaging member located within said cavity; and

a post pivotally mounted on said engaging member, said post being pivotally movable between a stowed position in which the post lies flat adjacent to and generally parallel to said ornament and extends toward said first point but terminates short thereof so that said post is located within said ornament periphery, and a use position in which the post extends generally perpendicularly from said ornament for insertion through a pierced opening in the wearer's earlobe, the clip portion being movable toward its earlobe clamping position for engaging the free end of the post.

5,487,281

METHOD AND APPARATUS FOR JOINING TWO EDGES OF A KNITTED TUBULAR ARTICLE

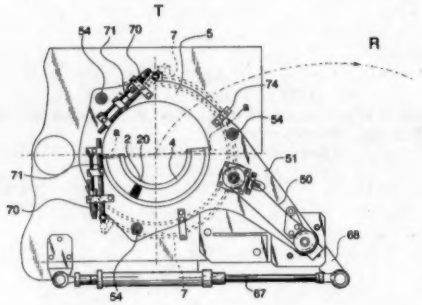
Alberto Frullini, and Paolo Frullini, both of Florence, Italy, assignors to Fabritex S.R.L., and Conti Florentia S.R.L., both of Firenza, Italy

Filed Jul. 8, 1994, Ser. No. 273,023

Claims priority, application Italy, Jul. 12, 1993, FI93A0128

Int. Cl.[6] D04B *9/56;9/18;35/00*

U.S. Cl. 66—13 **33 Claims**



1. A method for closing an end of a tubular knitted article, the method comprising the steps of:

knitting the tubular article in a circular knitting machine with a plurality of needles, said plurality of needles being divided into a first set and a second set, said first set of needles being positioned on one side of the tubular article and forming a first partial course of the tubular knitted article, said second set of tubular articles being positioned on another side of the tubular article and forming a second partial course of the tubular knitted article;

stopping said knitting when the tubular article is a desired length;

transferring the first partial course from said first set of needles to a transfer device in a first position adjacent said first set of needles;

rotating said transfer device about a diametrical axis of the tubular article to a second position to place the first partial course adjacent the second partial course;

transferring stitches from the first partial course on said transfer device to said second set of needles when said transfer device is in said second position;

rotating said transfer device back to said first position from said second position after said transferring of stitches from the first partial course to said second set of needles;

rotating said transfer device about a longitudinal axis of the tubular article from said first position to a third position adjacent said second set of needles after said rotating back to said first position;

transferring stitches of both the first and second partial courses from said second set of needles onto said transfer device;

moving said transferring device from said knitting machine to a linking station;

linking together said stitches of both the first and second partial courses on said transfer device at said linking station with a linking thread to close the tubular article.

5,487,282

PROCESS FOR KNITTING TUBULAR FABRIC ON A FLAT BED KNITTING MACHINE

Gottfried Kühnert, Aalen, Germany, assignor to Universal Maschinenfabrik, Westhausen, Germany

PCT No. PCT/EP92/00212, § 371 Date Nov. 1, 1993, § 102(e) Date Nov. 1, 1993, PCT Pub. No. WO92/15739, PCT Pub. Date Jul. 17, 1992

PCT Filed Jan. 31, 1992, Ser. No. 108,747

Claims priority, application Germany, Mar. 7, 1991, 41 07 316.9

Int. Cl.[6] D04B *1/22*

U.S. Cl. 66—69 **10 Claims**

1. A process for knitting a tubular fabric on a flat bed knitting machine having two main needle beds, two auxiliary needle beds each corresponding to a respective main needle bed, and a racking device, comprising the steps of:

transferring an edge stitch from a first needle on a first main needle bed to a first needle on a first auxiliary needle bed;

racking the first auxiliary needle bed with respect to its corresponding main needle bed;

transferring the stitch from the first needle on the first auxiliary needle bed to a second needle on the first main needle bed; and

knitting the second needle on the first main needle bed.

5,487,283

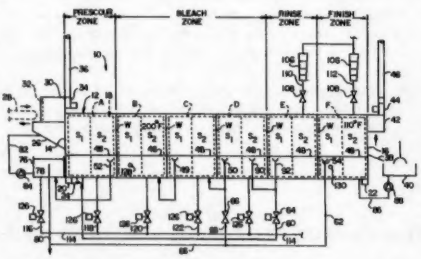
PRESCOUR BLEACHING TUNNEL

Sherman H. Sheppard, Pinnacle, N.C., assignor to Surry Chemicals, Inc., Mount Airy, N.C.

Continuation-in-part of Ser. No. 282,209, Jul. 28, 1994, Pat. No. 5,426,958, which is a continuation-in-part of Ser. No. 67,516, May 24, 1993, Pat. No. 5,333,475. This application Jun. 1, 1995, Ser. No. 456,528

Int. Cl.[6] D06F *23/02*

U.S. Cl. 68—27 **20 Claims**



16. Commercial bleaching apparatus comprising:

a horizontally disposed drum structure having an open inlet end into which textile goods to be bleached may be inserted, and an open outlet end through which bleached textile goods may be discharged,

said drum structure having stationary hollow cylindrical outer wall means, and perforated hollow cylindrical inner wall means concentrically disposed within said outer wall means and being operatively drivable relative thereto in a manner alternatively oscillating said inner wall means through a rotational arc of approximately 240° and then rotating said inner wall means through a full 360° arc, the interior of said outer

wall means being axially divided into a prescour zone positioned at said inlet end and bleach rinse zones positioned downstream of said prescour zone, and the interior of said inner wall means being divided into axial sections received in said prescour, bleach and rinse zones,

said inner wall means, in response to successive rotations thereof through full 360° arcs, being operative to axially shift textile goods from section to section thereof, toward said open outlet end, and then outwardly through said open outlet end;

drive means for operatively driving said inner wall means relative to said outer wall means at a rotational speed of approximately 5 RPM;

makeup means for continuously flowing water through said prescour and rinse zone and then to waste in a manner maintaining essentially constant, equal heights of water in lower side portions of said prescour and rinse zones and in the sections of said inner wall means disposed therein;

recirculating means for maintaining an essentially constant height of water in said bleach zone essentially equal to the water heights in said prescour and rinse zone,

said makeup means and said recirculating means being operative to maintain volumes of water in said prescour, bleach and rinse zones equal to from about 25% to about 30% of the total volumes of said prescour, bleach and rinse zones,

said recirculating means including means for periodically transferring water from said rinse zone back into said bleach zone;

heating means for heating water disposed in said prescour, bleach and rinse zones, said heating means being operative to maintain water temperatures within said drum structure that progressively decrease from said bleach zone to said rinse zone; and

means for selectively adding a bleaching agent to said bleach zone.

5,487,284

WASHING MACHINE HAVING PUNCH-WASHING FUNCTION

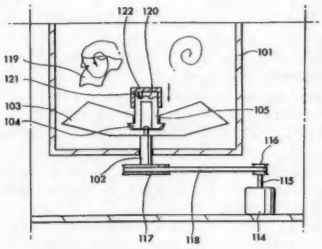
Jung H. Kim; Hae Y. Chung; Hyung S. Kim; Byeong H. Lee, and Young H. Roh, all of Seoul, Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Apr. 29, 1994, Ser. No. 235,513

Claims priority, application Rep. of Korea, Apr. 29, 1993, 1993-6986; Jul. 26, 1993, 1993-13986; Jul. 26, 1993, 1993-13987; Jul. 28, 1993, 1993-14446; Jan. 26, 1994, 1994-1387; Feb. 18, 1994, 1994-2955

Int. Cl.[6] **D06F** *37/30*

U.S. Cl. 68—3 SS **5 Claims**



1. A washing machine having a punch-washing function comprising:

a rotating member formed in one piece at a central surface of a pulsator; and

an elevating member oscillating vertically in conjunction with said rotating member of said pulsator, said elevating member having an inner portion partially surrounding the outer surface of the rotating member, a hollow interior portion adapted to receive said rotating member, and a sliding protrusion adapted to be inserted in grooves of the rotating member, the sliding protrusion projected inwardly from an inner peripheral surface of said elevating member.

5,487,285

LOCK WITH ROD-SHAPED ELEMENTS

René Leichel, Bovenkarspel, and Johannes E. Leichel, Purmerend, both of, Netherlands, assignors to Rene Leichel, Bovenkarspel, and Pieter Kwakernaat, Enkhuizen, both of, Netherlands

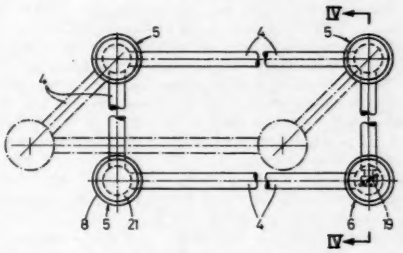
PCT No. PCT/NL93/00105, § 371 Date Nov. 22, 1994, § 102(e) Date Nov. 22, 1994, PCT Pub. No. WO93/24724, PCT Pub. Date Dec. 9, 1993

PCT Filed May 25, 1993, Ser. No. 338,637

Claims priority, application Netherlands, May 26, 1992, 9200925; Jan. 22, 1993, 9300129

Int. Cl.[6] **E05B** *71/00*

U.S. Cl. 70—18 **6 Claims**



1. Lock (1) for securing objects, in particular cycles, against theft, comprising a plurality of rod-shaped elements (4) connected with their ends by means of pivot means (5) to form a chain which is closable into a loop by means of a security lock (6), the pivot means (5) having movable parts (9, 10, 11; 25, 27) each housed within a protective casing (8; 24, 26), the ends of each rod-shaped element (4) being constructed as a bearing for permitting a rotation of each rod-shaped element (4) about its longitudinal axis relative to the casings (8), characterized in that the rod-shaped elements (4) project out of the casings (8; 24, 26) along the main portion of their length and are housed with their ends within said casings, the casings (8; 24, 26) allowing a relative pivoting movement of all adjacent rods (4) of at least substantially 180°, when the lock is (1) in closed condition.

5,487,286

LOCK ASSEMBLY FOR ANTI-THEFT DEVICE FOR VEHICLE

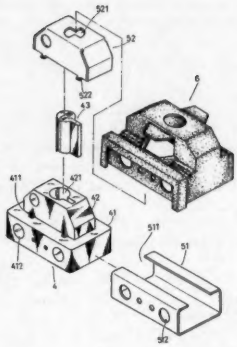
Ping-Hua Wu, No. 55, Cai Shen 2Rd, Kaohsiung, Taiwan, Prov. of China

Filed Feb. 2, 1994, Ser. No. 190,418

Int. Cl.[6] **B60R** *25/06*

U.S. Cl. 70—52 **1 Claim**

1. A lock assembly for an anti-theft device for a vehicle comprising a lock body including a base for engaging with a pair of shanks, said base having four planar side surfaces and a flat planar upper surface thereby forming a rectangular-shaped solid, at least two depressions formed on top of said base, a box secured on top of said lock body and including an orifice formed therein for receiving a core, said box comprising a substantially rectangular-shaped solid, smaller than said base, and having four side surfaces perpendicular to the upper surface of the base and a flat upper surface that is parallel to the upper surface of the base, the box being secured to the upper surface of the base leaving portions of the upper surface of the base exposed on either side of the box, said orifice having a substantially cylindrical shape, its axis being perpendicular to the upper surface of the box, said base having a



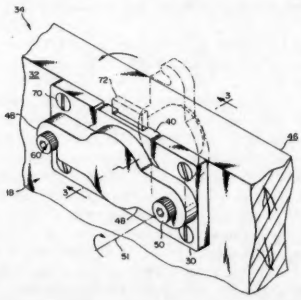
depression on the exposed portion of the upper surface of the base on either side of the box, a casing engaged on said box and including at least two ears engaged in said depressions of said base, said casing having four sides and an upper surface perpendicular to the sides thereby forming a generally rectangular-shaped solid that is open on the bottom, defining an inner hollow portion, configured to closely enclose the exposed surfaces of said box in a nesting relation when placed over the box, said ears being on opposite sides of the casing and extending perpendicularly outward from the sides and parallel to the upper surface of the base, a housing including two flanges having a slot formed therebetween for engaging with said casing, said flanges engaging with said ears so as to retain said ears within said depressions, said housing comprising a substantially rectangular prism open on both ends and having a slot on the upper surface connecting the open ends to allow the housing, to be slid over the assembled base, the slot being substantially the same width as the casing but not as wide as the base thereby defining flanges parallel and on either side of the slot, thereby allowing the box, and casing to protrude through the slot with said flanges covering the exposed portions of the upper surface of the base on either side of the box and retaining the ears in the depressions, thereby encasing and retaining the base, box, and casing in a nesting relationship, and a covering engaged on said casing and said housing for retaining said lock body in said housing.

5,487,287

QUICK-RELEASE LOCK RETAINING BRACKET METHOD AND APPARATUS

Mark S. Viggiano, 5225 Fidge Pl. NE., Tacoma, Wash. 98422

Filed Sep. 2, 1993, Ser. No. 116,005
Int. Cl.[6] E05B *9/08;65/46*
U.S. Cl. 70—86 **5 Claims**



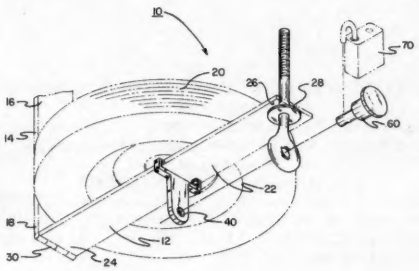
1. In a restricted access chamber having an access panel and a lock mountable on the access panel, the lock having a front key face, a rear flange portion having a rear face and a cylinder extending from the rear flange portion to the front key face, the cylinder being of smaller cross section than the rear flange portion such that the rear flange portion projects outward beyond the periphery of the cylinder, the access panel having an interior surface, an exterior surface, and a recess between the interior and exterior surfaces for closely receiving the lock cylinder, the lock cylinder being insertable into the recess by linear translation from the interior surface toward the exterior surface but insertion of the lock cylinder into the recess being limited by the rear flange portion of the lock, the improvement comprising a retaining bracket member mounted on the access panel adjacent to the interior surface thereof, said bracket member having a receiving channel aligned with the access panel recess and sized to receive the lock rear flange portion, a latch member movable manually relative to said bracket member between an open position out of registration with the access panel recess to allow insertion of the lock cylinder into the recess and a closed position registered with the access panel recess to form an abutment behind the rear face of the rear flange portion of the lock to block retraction thereof away from the interior surface of the access panel, and retaining means for normally maintaining the latch member in its closed position.

5,487,288

ANTI-THEFT DEVICE FOR A SPARE TIRE ON A PICK-UP TRUCK

Horst A. Frantz, 905 Fairoaks, Garland, Tex. 75040

Filed Jan. 19, 1995, Ser. No. 374,896
Int. Cl.[6] B62D *43/04;* **E05B** *65/12*
U.S. Cl. 70—259 **5 Claims**



1. An anti-theft device for a spare tire on a pick-up truck comprising, in combination:

a rigid spare tire locking tongue formed of a planar upper rail having an upper end, a lower end, and a length greater than a thickness of a spare tire of a pickup truck and with the upper end securable to a frame of a pick-up truck, a rigid planar lower rail having an inboard end and an outboard end and a length greater than a diameter of a spare tire of a pickup truck and with the outboard end having a bore disposed thereon and the inboard end coupled to the lower end of the upper rail with a hinge, the hinge allowing the lower rail to be placed in facing contact with a side of a spare tire of a pick-up truck positioned thereabove;

a rigid locking plate having an upper extent with a pair of opposed C-shaped locking arms slidably secured to the lower rail and a lower extent with an eyelet formed thereon;

a rigid locking screw disposed within the bore of the lower rail of the locking tongue, the locking screw having a threaded upper end threadably securable to a frame of a pick-up truck, a lower end with a ring which is fixedly attached thereto and alignable with the eyelet of the locking plate, and a flange formed thereon intermediate the upper and lower ends and positionable in contact with the lower rail of the locking tongue;

a rigid locking pin having a cylindrical tip end with a bore disposed therethrough, a circular planar head end having a

diameter greater than the tip end, and an intermediate cylindrical portion therebetween having a diameter greater than the tip end and less than the head end and with the intermediate portion slidably positioned within the ring of the locking screw and the tip end slidably positioned within the eyelet of the locking plate to thereby define a coupled configuration and with a lock insertable within the bore of the locking pin when placed in the coupled configuration for locking the spare tire to a pick-up truck.

5,487,289

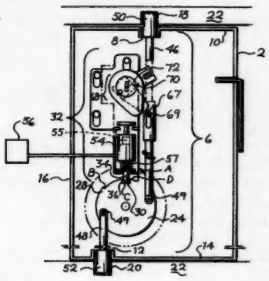
LOCK ASSEMBLY

John G. Otto, III, Grandville; Ronald W. Vanderwall, Hudsonville; Eugene R. Hamilton, Walker, and Kevin O. Osborn, Mattawan, all of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Jun. 23, 1993, Ser. No. 82,588

Int. Cl.[6] E05B *47/06*

U.S. Cl. 70—279 **27 Claims**



1. A lock assembly for locking a door to a frame element, comprising:

a rotatable locking element;

a locking rod connected to said rotatable locking element, wherein rotation of said locking element in one sense results in said locking rod moving toward a first side of said frame element and rotation in the other sense results in said locking rod moving away from said first side of said frame element;

a pin having a first end and a second end, wherein said first end selectively engages said rotatable locking element at an engaged position so that said locking element is prevented from rotating;

a pin actuating mechanism for moving said pin from said engaged position to a disengaged position wherein said pin does not engage said locking element; and

a rotatable cam having a striking surface to strike said second end of said pin when said pin is at said disengaged position causing said first end of said pin to contact and ride along a surface of said rotatable locking element as it rotates.

5,487,290

HIGH SECURITY LOCK MECHANISM

J. Clayton Miller, Nicholasville, Ky.; Michael Harvey, Newport Beach, Calif.; James L. Taylor, Lexington, Ky.; Thomas Clark, Lexington, Ky., and Gerry Dawson, Lexington, Ky., assignors to C & M Technology, Inc., Nicholasville, Ky.

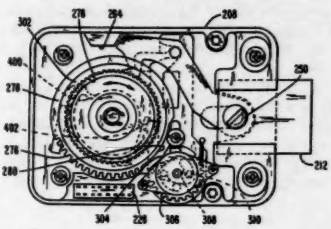
Continuation of Ser. No. 819,216, Jan. 13, 1992, abandoned. This application Jan. 11, 1995, Ser. No. 371,319

Int. Cl.[6] E05B *49/02*

U.S. Cl. 70—303 A **17 Claims**

1. A locking mechanism having a lock-bolt to be put in locking and unlocking positions thereof, comprising:

a first engagement element, having disengaged and engageable positions;



means actuable by electrical power for driving the first engagement element to the engageable position thereof;

a manually operated second engagement element which can be engaged with said first engagement element in said engageable position thereof;

a lock-bolt drive cooperating with the lock-bolt; and

means for moving said lock-bolt drive to a position directly engaged to the manually operated second engagement element so that the lock-bolt is moved from the locking position to unlocking position thereof in accordance with a manual movement of the manually operated second engagement element; wherein

said driving means comprises an electrical motor having a rotor rotatable about a rotation axis, said rotor having first and second stable positions respectively corresponding to said engageable and disengaged positions of said first engagement element, wherein said first and second stable positions are separated by a predetermined angle about the rotation axis; and

said first and second stable positions of said rotor are respectively determined by first and second magnetic detents.

5,487,291

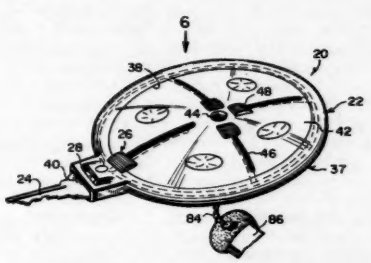
KEY HOLDER CASE WITH EASY ACCESS FEATURE

Bernard Voigt, 15 High St., Hicksville, N.Y. 11801

Filed May 23, 1994, Ser. No. 247,007

Int. Cl.[6] A47G *29/10*

U.S. Cl. 70—456 R **5 Claims**



1. An improved key holder case with easy access feature which comprises:

a) a housing for carrying at least one key therein;

b) means for easy accessing at least one key from said housing, so that at least one key will extend out from said housing, to allow a person to utilize at least one key in a lock, circular shaped member, having a large circular top opening therein and a side exit port, a large circular cover which fits into said large circular top opening, to pivot thereabout and having at least one elongated slide track radially placed therein, at least one slide button to ride within said at least one elongated slide track, and at least one clamp assembly for connecting said at least one slide button to at least one key, so that when said large circular cover is pivoted to align said at least one elongated slide track to said side exit port, said at least one slide button can go from a retracted position, in which at least

one key is withdrawn into said at least one elongated slide track in said housing to an extended position, in which at least one key will extend out from said side exit port in said housing;

c) at least one illuminating device built therein, so that said at least one illuminating device when activated will illuminate at least one key when extending out from said housing, allowing at least one key to be used at night and in dimly lit areas;

d) a clip mounted thereto, so that said clip is in a first instance attached to a belt and in a second instance worn on a garment.

5,487,292

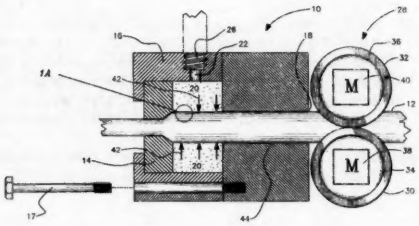
METHOD AND APPARATUS FOR ADVANCING TUBING INTO A DRAW DIE

Francis J. Fox, 2145 Corporation Blvd., Naples, Fla. 33942

Continuation-in-part of Ser. No. 815,031, Dec. 31, 1991, Pat. No. 5,327,756. This application Jun. 20, 1994, Ser. No. 262,689

Int. Cl.[6] B21C *9/00*

U.S. Cl. 72—43 **15 Claims**



1. An apparatus for advancing and reducing the diameter of tensile stressed tubing being drawn through a draw die wherein the tubing is reduced in diameter comprising in combination,

opposing rotatable roll means mounted on the front of the apparatus, the roll means providing a cushioned exterior for compressingly engaging and moving the tubing horizontally under axial compressive stress in the forward direction,

a sealing means providing an elongated circular bushing extending horizontally in the forward direction from the roll means towards the draw die for conveying the moving tubing in the forward direction, the inside diameter of said bushing means having zero clearance with the outside diameter of said tubing forming a non-diameter reducing seal therebetween,

an enclosed draw die providing a cylindrical socket opening sealed approach zone encircling the conveying tubing prior to entering the draw die,

the socket opening approach zone providing means for applying high pressure lubricant created hydraulic pressure to the tubing preventing the tubing from bulging outwardly,

the draw die creating tensile stress by pulling therethrough wherein the tubing is reduced in diameter.

5,487,293

HIGH INTENSITY PEENING FLAPS WITH FASTENER, AND WHEELS INCORPORATING SAME

Michael W. Lovejoy, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Oct. 18, 1994, Ser. No. 324,746

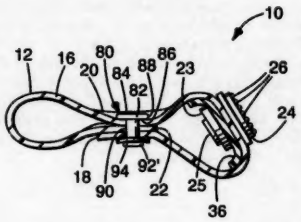
Int. Cl.[6] B21J *5/00*

U.S. Cl. 72—53 **42 Claims**

1. A peening flap, comprising:

a strap including a first strap portion, a second strap portion, a first aperture formed in said first portion and a second aperture formed in said second portion;

peening means mounted on said strap; and



a fastener affixed to said strap for securing said first and second strap portions together, said fastener including:

a shaft extending through said apertures, said shaft having a first end and a second end; and

a first head adjoining said first end and a second head adjoining said second end; wherein said first and second strap portions have a combined thickness and are secured between said first and second heads; and

wherein said second head includes elastic compression means for maintaining compression on said strap portions, said elastic compression means having sufficient elasticity to maintain compression on said strap portions with reducing combined thickness.

5,487,294

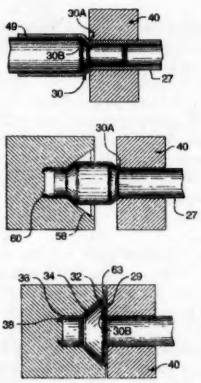
SYSTEM FOR FORMING END FLANGES ON PIPES

Horst U. Petersen, Kitchener, Canada, assignor to Bend All Manufacturing Inc., Ayr, Canada

Filed Jun. 24, 1994, Ser. No. 265,119

Int. Cl.[6] B21D *19/08*

U.S. Cl. 72—370 **8 Claims**



1. Procedure for producing an enlarged end-flange on a pipe, being an end-flange which includes front and back radially-extending walls formed in the material of the pipe, the walls being opposed in that the front wall faces towards the end of the pipe and the back wall faces away from the end of the pipe, and which includes an endmost-portion of the end-flange, the endmost-portion being cylindrical and of approximately the same diameter as the nominal diameter of the pipe, wherein:

the end-flange of the pipe is of the type in which, inside the end-flange, the front wall is axially spaced from, and out of contact with, the back wall;

the procedure includes the steps of clamping the pipe in a female die, leaving an end-portion of the pipe protruding from the die, the die having an inner surface complementary to the pipe, having a surface facing the end of the pipe, and having a transition corner therebetween;

belling-out the protruding end-portion of the pipe, creating a transition between the belled end-portion and the portion of the pipe gripped in the female die;

providing a male punch, having a nose, a shoulder of greater diameter than the nominal inside diameter of the pipe, and having a transition corner between the shoulder and the nose;

with the male punch inside the belled end-portion, pushing the male punch far enough axially, that the wall material of the pipe, at the said transition, is coined between the transition corner of the die and the transition corner of the punch;

withdrawing the male punch, leaving the pipe with the whole length of the end-portion belled;

reducing the diameter of a endmost-portion of the belled end-portion, being less than the whole length of the end-portion, leaving an inner-length-portion of the belled end-portion not reduced;

while constraining the length of the endmost-portion against diametral expansion and with the interior of both the endmost-portion and inner-length-portion being unsupported, pushing axially on the pipe to the extent that the inner-length-portion of the end-portion buckles or collapses, and increases in diameter, thereby creating the said front and back walls;

ceasing pushing axially on the pipe before the front wall touches the back wall internally, and while the front and back walls are still internally spaced apart in the axial sense.

5,487,295

METHOD OF FORMING A METAL CONTAINER BODY

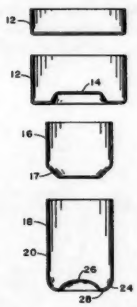
Hans H. Diekhoff, Avonmore, and George L. Smith, Jr., New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 108,898, Aug. 18, 1993, Pat. No. 5,394,727. This application Mar. 3, 1995, Ser. No. 397,815

The portion of the term of this patent subsequent to Aug. 18, 2013, has been disclaimed.

Int. Cl.[6] B21D *22/28*

U.S. Cl. 72—379.4 **7 Claims**



1. A method of forming a metal container body which comprises;

providing a metal cup having a sidewall and a base wall which includes a central transverse wall portion; a generally cylindrical annular wall portion around said central wall portion and connected to an outer peripheral wall portion which is offset with respect to said transverse wall portion; and

reducing the diameter of said cylindrical annular wall of said metal cup and reforming said annular wall portion into a generally frusto conical wall portion between said central wall portion and the sidewall of the cup.

5,487,296

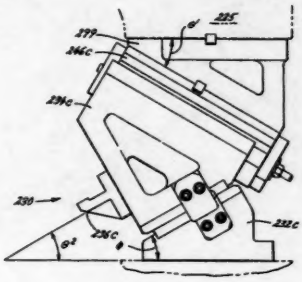
UNIVERS CAM UNIT

Roland T. Gerhart, Milford, and Erich D. Fidziukiewicz, Canton, both of Mich., assignors to Connell Limited Partnership, Boston, Mass.

Continuation-in-part of Ser. No. 819,347, Jan. 9, 1992, Pat. No. 5,269,167. This application Nov. 29, 1993, Ser. No. 158,613

Int. Cl.[6] B21D *5/04*

U.S. Cl. 72—381 **30 Claims**



1. For use in a power press having a die set, a pressure pad unit which is movable relative to the die set to hold a workpiece therebetween, and a ram, a universal cam assembly having means for receiving a working tool for performing an operation on the workpiece, comprising, in combination:

a mounting bracket having a mounting structure and a gib, the mounting structure being fixedly attached to the power press, the gib being disposed beneath the mounting structure;

a slide block having an inclined cam bearing surface, a working surface and a slide block bracket, the slide block bracket slidably coupling the slide block to the gib of the mounting bracket to move between a retracted position and an extended position;

a driver assembly fixedly attached to the power press opposite the slide block, the driver assembly having an inclined driver bearing surface disposed substantially parallel to the inclined cam bearing surface such that when the cam bearing surface abuts the driver bearing surface, the cam bearing surface slides along the driver bearing surface and the slide block moves between the retracted and the extended positions; and,

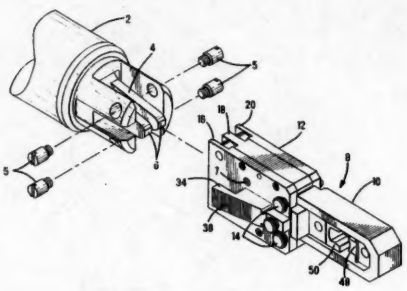
a spring assembly disposed within the gib for returning the slide block as the slide block moves between the retracted and extended positions, the spring assembly including a first stop block disposed at a first end of the gib; a second stop block disposed at a second end of the gib opposite the first stop block; a return spring disposed adjacent the first stop block; a damping spring disposed adjacent the second stop block; and a compression arm disposed between the return spring and the damping spring, the compression arm being attached to the slide block for movement therewith such that the compression arm compresses the return spring against the first stop block as the slide block moves from the retracted position to the extended position and the compression arm compresses the damping spring against the second stop block as the slide block moves from the extended position to the retracted position.

5,487,297

CRIMPING TOOL HAVING MECHANISM FOR SELECTIVELY BIASING CRIMPING DIES TO OPEN OR CLOSED POSITION

Dale Ryan, and Eric Kootte, both of Harrisburg, Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Jan. 17, 1995, Ser. No. 373,349
Int. Cl.[6] B21J *9/18*
U.S. Cl. 72—450 11 Claims



1. A tool for crimping a workpiece, comprising:

a frame;

a mating pair of crimping dies, one of which is attached to said frame, the other of which is attached to a slide member coupled to said frame and arranged to reciprocate for effecting movement of said other die along a die axis toward and away from said one die;

a pair of links each having one end pivotally attached to said slide member;

a pair of link rollers each journaled for rotation at an end of a respective one of said links opposite to said pivotal attachment thereof, said link rollers having mutually parallel axes of rotation;

a pair of ramps attached to said frame on respective opposite sides of said link rollers and arranged for rolling engagement by respective ones of said link rollers;

an actuator attached to said frame and operable to move a wedge between said link rollers along a wedge axis parallel to said die axis, said wedge being arranged to engage said link rollers during movement of said wedge in one direction such that said link rollers roll on opposite sides of said wedge and are urged into rolling engagement with said ramps, thereby moving said slide member such that said other die is moved toward said one die for effecting said crimping;

resilient means for biasing apart said links with a relatively small force such that said link rollers are urged into rolling engagement with respective ones of said ramps when said wedge is in a disengaged position from said link rollers; and,

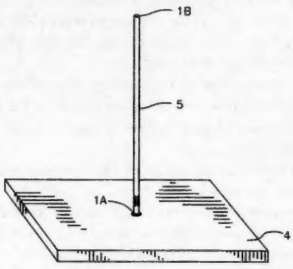
means for retracting said slide member such that said other die is selectively movable away from said one die when said wedge is in said disengaged position, wherein said other die is separable from said one die against the biasing force of the resilient means to permit said workpiece to be introduced between said dies, and upon release of said means for selectively retracting, said resilient means urges said other die toward said one die to secure said workpiece therebetween.

5,487,298

INERTIAL HOPKINSON BAR SHOCK SENSOR

William R. Davis, Darlington, and Willard S. Walton, Churchville, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 22, 1994, Ser. No. 215,878
Int. Cl.[6] G02M *7/00*
U.S. Cl. 73—12.05 15 Claims



14. A method for measuring the intensity of high amplitude strain waves upon impact of a projectile or detonation of an explosive on a test specimen comprising:

(1) welding a first end portion of a bar to said test specimen;

(2) attaching first and second strain gages onto said bar at a first and a second position, respectively;

(3) orienting said first and second strain gages onto said first and second positions so that said gages are positioned opposite to each other;

(4) connecting said first and second strain gages in a measurement circuit so as to negate any bending effect on said bar,

(5) impacting a surface of the test specimen with shock waves;

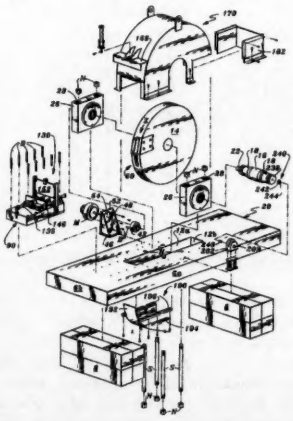
(6) measuring longitudinal strain only.

5,487,299

APPARATUS AND METHOD FOR DESTRUCTIVE TESTING OF COUPONS FORMED FROM METAL

Calvin C. Williamson, and Jeffrey S. Salsman, both of Napa, Calif., assignors to Napa Pipe Corporation, Napa, Calif.

Filed Nov. 4, 1994, Ser. No. 334,819
Int. Cl.[6] G01P *15/00*
U.S. Cl. 73—12.09 24 Claims



1. An apparatus for destructive testing of a coupon formed from metal, comprising, in combination:

a flywheel having an outer periphery,

a hammer fixed to said flywheel and oriented to extend beyond said outer periphery thereby providing a hammer striking surface nose which orbits with said flywheel and said striking surface nose remains exposed beyond said flywheel,

a carriage means,

means for moving said carriage means from a first retracted position clear of said hammer striking surface to a second deployed position in a path of said hammer striking surface,

coupon supporting means disposed on said carriage means, and

sensing means allowing said coupon to be moved to said second deployed position, whereby in said second deployed position, said coupon is placed in the path of said hammer.

5,487,300

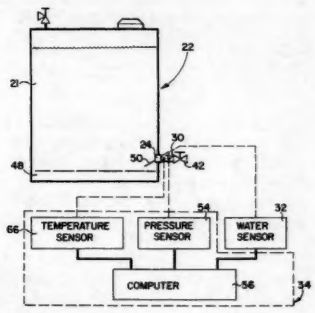
TANK GAUGING APPARATUS AND METHOD

Anne W. Brackett; Marcus O. Durham, both of Tulsa; Lynn K. Perkins, Skiatook, and Gregory E. Thoman, Tulsa, all of Okla., assignors to W. L. Walker Co., Inc., Tulsa, Okla.

Division of Ser. No. 901,563, Jun. 19, 1992, Pat. No. 5,333,498. This application May 12, 1994, Ser. No. 241,965

Int. Cl.[6] G01F *23/00*

U.S. Cl. 73—61.59 **28 Claims**



1. Apparatus for measuring physical characteristics of a liquid to be transferred to or from a storage tank with all measurements being taken through an opening near the bottom of the tank, comprising:

a conduit having a first open end connected to the opening in the tank, a second open end, and at least one connection for accessing the interior of the conduit between each end;

means insertable from outside the conduit for making a releasable and sealable connection with the at least one connection of the conduit for detecting one or more physical characteristics of the liquid and generating a readable signal representative of the one or more physical characteristics.

5,487,301

TEST RIG AND PROCESS FOR TESTING MOTOR VEHICLE ASSEMBLIES, IN PARTICULAR INDEPENDENT WHEEL SUSPENSION

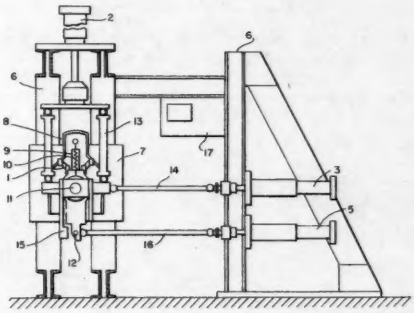
Andreas Müller, Darmstadt; Vatroslav Grubisic, Reinheim, and Gerhard Fischer, Darmstadt, all of, Germany, assignors to Fraunhofer-Gesellschaft zur Foerderung der Angewandten Forschung, Munich, Germany

Filed Feb. 3, 1993, Ser. No. 13,099

Claims priority, application Germany, Feb. 5, 1992, 42 03 262.8

Int. Cl.[6] G01M *19/00;* **G01N** *3/00*

U.S. Cl. 73—118.1 **6 Claims**



1. Test rig for testing motor-vehicle assemblies of the type including spring means under operational loading conditions comprising:

a frame for rigidly supporting the motor-vehicle assembly;

modifying means for modifying the spring means of the motor-vehicle assembly for linearising a spring characteristic of said spring means;

loading means for inducing vertical forces F_Z, lateral forces F_Y, longitudinal forces F_X and braking or driving forces F_{XB} in the motor-vehicle assembly; and

control means for controlling the loading means in such a way that the vertical forces F_Z, lateral forces F_Y, longitudinal forces F_X and braking or driving forces F_{XB} are induced, in accordance with a predetermined control loading program, by means of which different loading cases which are realistic in relation to actual motoring physics and combined to form loading blocks are repeatedly and in temporary consecutive sequence simulated in the motor vehicle assembly, wherein said control loading program comprises as loading cases driving straight ahead, cornering, braking and accelerating and according to which actual forces in accordance with the formula

$$F_{Ri}(t_j)=B_{Ri}(t_j)\cdot a_{Ri}\cdot P_r$$

are applied during a corresponding time t_j to the motor vehicle assembly; wherein i denotes the loading case with i=1 for driving straight ahead, i=2 when cornering, i=3 for braking and i=4 for accelerating; wherein further R denotes the load direction with R=z for the vertical force, R=x for the longitudinal force, R=xB for the braking and driving force and R=y for the lateral force; so that the forces to be applied are as follows:

Forces to be applied in the different loading cases:

Type of force	Straight ahead	Cornering	Braking	Accelerating
F_Z (vertical force)	$F_{Z1}(t_j)$	$F_{Z2}(t_j)$	$F_{Z3(0)}$	$F_{Z4}(t_j)$
F_X	$F_{X1}(t_j)$	$F_{X2}(t_j)$	$F_{X3(0)}$	$F_{X4}(t_j)$

-continued

Forces to be applied in the different loading cases:				
Type of force	Straight ahead	Cornering	Braking	Accelerating
(longitudinal force)				
F_{XB} (braking or driving force)	$F_{XB1}(t_j)$	$F_{XB2}(t_j)$	$F_{XB3(0)}$	$F_{XB4}(t_j)$
F_Y (lateral force)	$F_{Y1}(t_j)$	$F_{Y2}(t_j)$	$F_{Y3(0)}$	$F_{Y4}(t_j)$

with $B_{R1}(t_j)$ in the above formula being basic forces which are for the corresponding loading cases as follows:

Basic forces for the different loading cases:				
Type of force	Straight ahead	Cornering	Braking	Accelerating
F_Z (vertical force)	$B_{Z1}(t_j)$	$B_{Z2}(t_j)$	$B_{Z3(0)}$	$B_{Z4}(t_j)$
F_X (longitudinal force)	$B_{X1}(t_j)$	$B_{X2}(t_j)$	$B_{X3(0)}$	$B_{X4}(t_j)$
F_{XB} (braking or driving force)	$B_{XB1}(t_j)$	$B_{XB2}(t_j)$	$B_{XB3(0)}$	$B_{XB4}(t_j)$
F_Y (lateral force)	$B_{Y1}(t_j)$	$B_{Y2}(t_j)$	$B_{Y3(0)}$	$B_{Y4}(t_j)$

and with a_{R1} being at least one of vehicle- and axle specific conversion factors and P_R being test-rig-specific conversion factors which are as follows for the different loading cases:

	Vehicle- and[/or] axle-specific conversion factors for the different loading cases				Test-rig-specific
Type of force	Straight ahead	Cornering	Braking	Accelerating	conversion factor
F_Z (vertical force)	a_{Z1}	a_{Z2}	a_{Z3}	a_{Z4}	P_Z
F_X (longitudinal force)	a_{X1}	a_{X2}	a_{X3}	a_{X4}	P_X
F_{XB} (braking or driving force)	a_{XB1}	a_{XB2}	a_{XB3}	a_{XB4}	P_{XB}
F_Y (lateral force)	a_{Y1}	a_{Y2}	a_{Y3}	a_{Y4}	P_Y

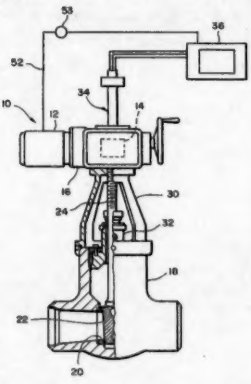
so that a given force $F_{R1}(t_j)$ according to the control loading program equals a basic force $B_{R1}(t_j)$ modified by multiplication with a vehicle-and/or axle-specific conversion factor a_{R1} and a test-rig-specific conversion factor P_r.

5,487,302

METHOD AND SYSTEM FOR MEASURING GATE VALVE CLEARANCES AND SEATING FORCE

Donald A. Casada; Howard D. Haynes, both of Knoxville; John C. Moyers, Oak Ridge, and Brian K. Stewart, Burns, all of Tenn., assignors to Lockheed Martin Energy Systems, Inc., Oak Ridge, Tenn.

Continuation of Ser. No. 24,143, Mar. 1, 1993, abandoned.
This application Feb. 28, 1995, Ser. No. 396,092
Int. Cl.[6] F16K *37/00*
U.S. Cl. 73—168 **22 Claims**



1. A system for determining operative conditions of a valve having a valve element connected to a threaded valve stem translatable by threaded engagement with a rotatable drive member to move the valve element between open and closed positions, said threaded valve stem being generally constrained from angular movement by engagement with guide means, the system comprising:

means for measuring absolute rotation of the valve stem during rotation of the rotatable drive member; and

means for correlating the measured absolute valve stem rotation to at least one operative condition of the valve.

5,487,303

SPEEDOMETER CAPABLE OF PROVIDING REAL-TIME SPEED PULSE SIGNALS

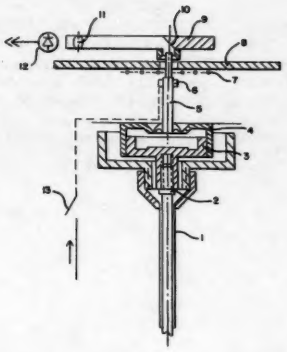
Yang R. Li, Room 302, No. 9, Building B, Shantou University, Shantou City, Guangdong, China

Filed Jul. 6, 1993, Ser. No. 87,652
Claims priority, application China, Jul. 8, 1992, 92105176.X
Int. Cl.[6] G01P *3/10*
U.S. Cl. 73—499 **14 Claims**

1. A speedometer providing real-time speed signals, comprising a magnet-type speed transmitting portion, a speed indicating portion, a photoelectric monitoring portion and a speed signal conversion portion;

said speed transmitting portion having a driving flexible shaft connected to a driving shaft, the driving shaft being fitted with a permanent magnet magnetically-coupled with an iron cup, the iron cup being fitted with a speed indicating needle shaft;

said speed indicating portion having a photoelectric speed indicating needle connected to said speed indicating needle shaft,



a speed indicating dial being positioned under the photoelectric speed indicating needle;

said photoelectric monitoring portion comprising:

a LED disposed on the speed indicating needle shaft, the light emitted from the LED travels through the photoelectric speed indicating needle, and transmitted out from the photoelectric speed indicating needle;

a plurality of photoelectric sensors positioned on the periphery of the indicating dial at locations corresponding to the speed marks, said plurality of photoelectric sensors functioning to receive the light from the speed indicating needle and provide electric signals;

said speed signal conversion portion comprising:

a multichannel photoelectric converter connected to said photoelectric sensors at their terminals;

a coder including an interface, and a photoelectric amplifier including an interface, connected to the outputs of said multichannel photoelectric converter, respectively, to form sets of interfaces for providing real-time speed signals.

5,487,304

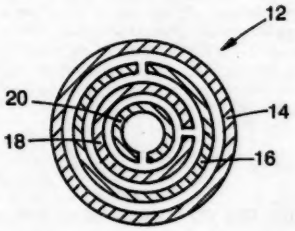
SUPERCONDUCTING DUAL JUNCTION GYROSCOPE APPARATUS

Martin A. Sanzari, Hamburg, N.J., assignor to Kearfott Guidance and Navigation Corporation, Wayne, N.J.

Filed Aug. 17, 1993, Ser. No. 108,125

Int. Cl.[6] G01P *3/44*

U.S. Cl. 73—504.07 **19 Claims**



1. A superconducting dual junction gyroscope apparatus having a superconducting shield for shielding external magnetic fields and preventing the generation of a London moment field when said superconducting shield is rotated, said apparatus comprising:

a closed housing having an outer layer of mu-metal material and a plurality of nested layers of superconducting material, said plurality of nested layers of superconducting material being divided so as to introduce discontinuities in the superconducting material of said plurality of nested layers and thereby disrupt superelectrons traveling within the superconducting material of said plurality of nested layers; and

a gyroscope sensor securely mounted within said housing for detecting a rotation of said housing.

5,487,305

THREE AXES ACCELEROMETER

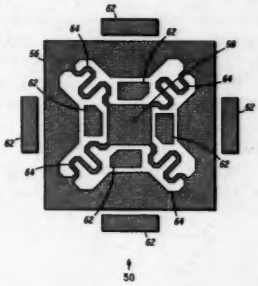
Ljubisa Ristic, Phoenix; Ronald J. Gutteridge, Paradise Valley; Wu Koucheng; Michael F. Calaway, both of Phoenix, and William C. Dunn, Mesa, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 810,063, Dec. 19, 1991, abandoned.

This application Jul. 12, 1994, Ser. No. 274,128

Int. Cl.[6] G01P *15/125*

U.S. Cl. 73—514.32 **14 Claims**



1. A three axis accelerometer comprising:

a semiconductor substrate;

a plurality of layers of conductive material formed on the substrate, each layer of conductive material generally defining a plane and each mounted so the defined planes are parallel with and in spaced relation to each other, a first of the layers being fixedly mounted and with a second layer being mounted by a plurality of flexible arms each having a first end attached to a center post supported on the substrate and a second end attached to support the second layer for limited movement of the second layer relative to the first layer;

the first and second layers forming a first capacitance varying in accordance with acceleration of the accelerometer along a first axis perpendicular to the first and second layers;

a plurality of first surfaces and a plurality of electrically isolated plates formed as a portion of the second and the first layers, respectively, and positioned in parallel juxtaposition, the plurality of first surfaces being moveable with the second layer and relative to the first layer, the plurality of first surfaces and the plurality of electrically isolated plates being further formed to define second and third axes mutually orthogonal with each other and the first axis; and

variable capacitances being formed between the plurality of first surfaces and the plurality of electrically isolated plates, which capacitances vary in accordance with acceleration in the second and third axes, respectively.

5,487,306

PHASE ABERRATION CORRECTION IN PHASED-ARRAY IMAGING SYSTEMS

Jose-Mauro P. Fortes, Gavea, Brazil, assignor to General Electric Company, Schenectady, N.Y.

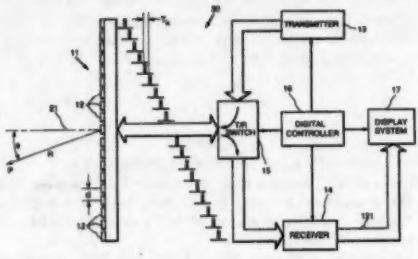
Filed Sep. 26, 1994, Ser. No. 312,363

Int. Cl.[6] G01N *29/06;29/10;29/24*

U.S. Cl. 73—597 **15 Claims**

1. A sampled aperture imaging system comprising:

a plurality of transducers arranged in a sequence to form an array;



means for selectively operating said transducers in a transmission mode to produce propagating energy pulses from electrical driving signals;

means for selectively operating said transducers in a reception mode to produce analog electrical detection signals in respective ones of a plurality of receive channels in response to detection of reflected energy pulses, each receive channel being coupled to a corresponding one of said transducers;

means for sampling and demodulating said analog electrical detection signals into digital complex signal samples; and

Kalman filter means for recursively estimating phase differences associated with digital complex signal samples in pairs of adjacent receive channels.

5,487,307

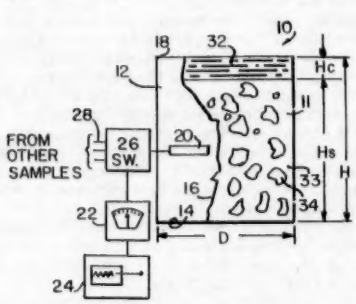
METHOD AND APPARATUS FOR TESTING CONCRETE EXPANSION

Robert Landgren, Cody, Wyo., and William F. Perenchio Northfield, Ill., assignors to Kalman Floor Company, Ir ., Evergreen, Colo.

Filed Feb. 10, 1994, Ser. No. 194,452

Int. Cl.[6] G01N *33/38*

U.S. Cl. 73—803 **17 Claims**



1. Apparatus for measuring volumetric changes in hardenable samples comprising:

a steel container having an open top and an uninterrupted upstanding sidewall for receiving and containing a hardenable sample therein in intimate and direct contact with an inner surface of said sidewall; and

strain gauge means secured to the sidewall of the container and being disposed for sensing expansive changes in said sidewall in response to volumetric changes in the sample upon hardening and being operable when energized to produce a signal indicative of such volumetric changes in the sample.

5,487,308

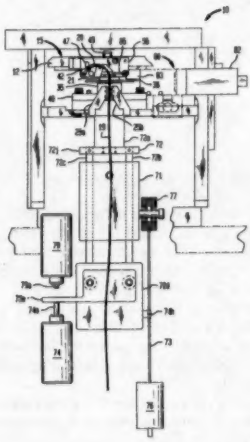
NEEDLE AND SUTURE AUTOMATIC PULL-TEST SYSTEM

David Demarest, 709 S. Beverwyck Rd., Parsippany, N.J. 07054; Timothy Lenihan, 213 Valerie Rd., Morrisville, Pa. 19067, and John F. Blanch, 141B Wayside Rd., Tinton Falls, N.J. 07724

Filed Jan. 13, 1994, Ser. No. 181,601

Int. Cl.[6] G01N *3/10*

U.S. Cl. 73—827 **21 Claims**



1. An apparatus for automatically testing the swage bond strength of an armed needle having a suture strand depending from a suture receiving end thereof, said apparatus comprising:

(a) blade means for supporting said suture receiving end of said armed needle when a positive downward gravitational force of predetermined controllable value is applied to said suture strand, said blade means having at least one suture receiving guide therein;

(b) indexing means for releasably engaging said armed needle and for positioning said armed needle at said blade means to enable said suture strand to be received within said suture receiving guide thereof; and

(c) gripping means for positively gripping said suture strand at a first position below said suture receiving opening of said blade means, said gripping means including a vertically suspended slide block means consisting of a mass of predetermined weight for applying said positive downward force of predetermined value to said gripped suture strand, said gripping means and said slide block means being vertically slidably mounted along a fixed mounting means, said fixed mounting means being positioned substantially parallel with a vertical axis defined by said suture strand.

5,487,309

DEVICE FOR TESTING MEDICAL INFUSION

Malcolm C. Brown, 23 Carpenters Lane, West Kirby, Wirral L48 7EX, and Paul E. Hammond, 18 Townfield Road, West Kirby, Wirral, both of, United Kingdom

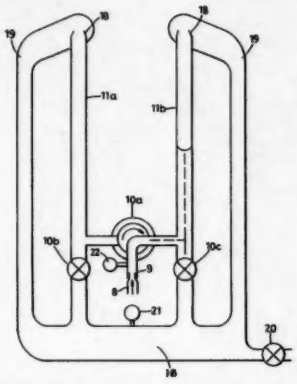
Continuation-in-part of Ser. No. 910,908, Jun. 8, 1992, abandoned. This application Mar. 9, 1994, Ser. No. 207,703

Claims priority, application United Kingdom, Jun. 8, 1991, 9112351

Int. Cl.[6] G01F *1/00;* **A61M** *31/00*

U.S. Cl. 73—861 **4 Claims**

1. A testing device for a medial infusion device, the testing device comprising:



optical means for sensing levels of a fluid in a tube and logic means for calculating a flow rate based upon the time taken for the fluid to pass between two levels,

a first and second tube, said tubes being substantially identical,

valve means for feeding the fluid to the first tube and draining the fluid from the second tube down to a predetermined level,

wherein the optical means comprises a charge coupled device for sensing the fluid level substantially continuously along the entire length of each of the first and second tubes and wherein the logic means calculates flow rates when the fluid is rising in one of said first and second tubes but inhibits a display of the flow rate if the calculation is based on too small a change of level,

the optical means sensing when the fluid level approaches the top of one of the first and second tubes and signaling the logic means so as to cause the valve means to direct the flow of the fluid to the other of said first and second tubes so that measurement continues smoothly, wherein the optical means and logic means are arranged to drain said one of said first and second tubes when full, down to near a bottom portion of said one tube and to then seal off said one tube and

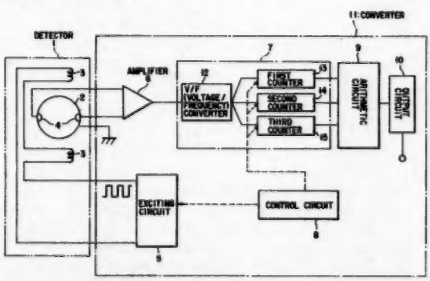
a control module for displaying spot and average flow rate readings.

5,487,310

ELECTROMAGNETIC FLOWMETER

Takashi Higuchi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 8, 1994, Ser. No. 272,230
Claims priority, application Japan, Jul. 9, 1993, 5-170439
Int. Cl.[6] G01F *1/60*
U.S. Cl. 73—861.17 **21 Claims**



1. An electromagnetic flowmeter comprising:

a measurement tube for passing a fluid to be measured;

alternating magnetic field application means for applying alternating magnetic field and periodically switching magnetic fields applied in a first direction on a plane perpendicular to a direction in which the fluid flows and in a second direction opposite to the first direction;

sampling means for sampling electromotive force caused in the fluid by the magnetic fields in the first and second directions by plural times in the same direction in one period; and

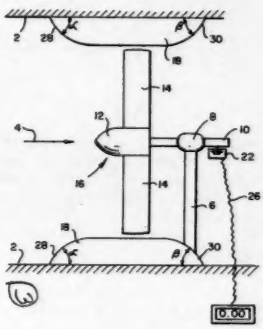
arithmetic means for deriving the flow rate by the arithmetic process by excluding a sampling value which is contained in the sampling values obtained by the plurality of sampling operations and which exceeds a preset range or replacing the same by a simulated value.

5,487,311

AIR VELOCITY AVERAGING ROTOR

Alfonso C. Guativa, Champaign; David M. Schwenk, Urbana, both of Ill., and James P. Miller, Zama, Japan, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 4, 1995, Ser. No. 416,554
Int. Cl.[6] G01F *15/00*
U.S. Cl. 73—861.77 **13 Claims**



1. A device for measuring air flow velocity in a duct, comprising:

(a) flow directing means mounted within the duct, said flow directing means containing a circular opening;

(b) turbine means centrally positioned within said circular opening for responding to the air flow, said turbine means including

(1) a rotor shaft aligned substantially parallel to the direction of air flow;

(2) a rotor hub rigidly connected with said shaft; and

(3) a plurality of rotor blades extending radially outward from said rotor hub;

(c) mounting means connected within the duct for rotatably supporting said turbine means;

(d) means connected with said turbine means for sensing the rotation thereof; and

(e) means connected with said sensing means for indicating air flow velocity as a function of the rate of rotation of said turbine means and

wherein said flow directing means includes an outer peripheral surface contiguous with inner surface of the duct and an inner peripheral surface adjacent the outer edge of said rotor blades, whereby substantially all of the air flow through the duct is directed past said rotor blades.

5,487,312

GAS ANALYZER WITH REGULATED MEASUREMENT GAS FEED AND DYNAMIC DILUTION OF SAMPLES

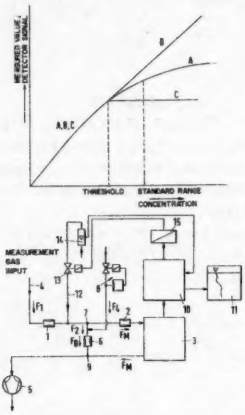
Melchior Kahl, Bergisch-Gladbach, and Friedhelm Risse, Köln, both of, Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Oct. 7, 1994, Ser. No. 320,051

Claims priority, application Germany, Jan. 8, 1993, 43 34 336.8

Int. Cl.[6] G01N *27/50*

U.S. Cl. 73—863.01 **6 Claims**



1. A continuously operating gas analyzer, comprising: a detector having an input and an output; a regulated measurement gas feed including a measurement gas pump (**5**, **21**) at the detector input or detector output, a first choke (**2**) which is connected in a measurement gas line upstream of the detector (**3**), a second choke (**6**) which is connected in parallel with the series connection of the first choke (**2**) and the detector (**3**) as a bypass, a third choke (**1**) which is arranged in the measurement gas line and connected in series upstream of a junction (**7**) of the first choke (**2**) and the second choke (**6**), and a pressure regulator (**8**, **25**) which maintains constant pressure at the junction (**7**) of the three chokes (**1**, **2**, **6**);

a dilution gas line (**12**) with a control valve (**13**) for continuous dilution of the measurement gas with an inert gas, the dilution gas line being connected to the measurement gas line between the first choke (**2**) and third choke (**1**);

a dilution regulator (**15**) connected to the output of the detector via a computer (**10**) which dilution regulator is operative to readjust the inert gas flow via the control valve (**13**) in such a way that an amplified detector output signal is maintained at a given reference value, wherein the dilution of the measurement gas flow increases as the measurement gas concentration increases; and

a flow meter (**14**) arranged in the dilution gas line (**12**), the flow meter (**14**) having a measurement signal that is processed together with the detector signal in the computer (**10**) connected with the detector (**3**) and dilution regulator (**15**) to generate the analysis measurement.

5,487,313

FLUID-LOCK FIXED-VOLUME INJECTOR

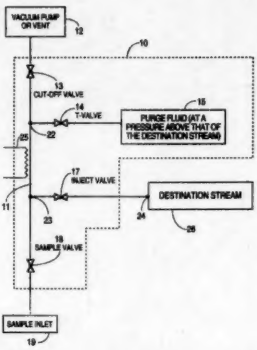
Paul H. Johnson, Oakland, Calif., assignor to Microsensor Technology, Inc., Fremont, Calif.

Filed Nov. 30, 1993, Ser. No. 158,978

Int. Cl.[6] G01N *30/00; 1/00*

U.S. Cl. 73—863.71 **32 Claims**

1. An injector assembly for injecting a fixed volume of a first fluid comprising:



a chamber for containing an amount of the first fluid, and having a first valve at one end to connect said chamber to a first fluid source, a portion of the chamber defining said fixed volume;

a second valve connected to the chamber at one end of the fixed-volume portion, thereby causing a second fluid stream from a second fluid source to flow into the fixed-volume portion and forcing the first fluid in the fixed-volume portion into a destination passage;

a third valve connected to the chamber at an end of the fixed-volume portion opposite said second valve, and communicating the fixed-volume portion to the destination passage; and

a fourth valve connected to the chamber at an end opposite said first valve, thereby trapping the first fluid in the chamber.

5,487,314

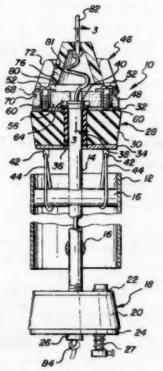
WATER SAMPLING APPARATUS

William H. Phillips, Saginaw, Mich., assignor to Trippensee Corporation, Saginaw, Mich.

Filed May 2, 1994, Ser. No. 236,268

Int. Cl.[6] G01N *1/12*

U.S. Cl. 73—864.66 **11 Claims**



1. Water sampling apparatus comprising:

a hollow body open at its opposite ends and adapted to be lowered to a predetermined depth in a body of water;

a first closure member for one end of said body;

a second closure member for the other end of said body;

a connecting rod connecting said first and said second closure members for relative movements toward and away from one another and toward and away from sealing relation with the associated ends of said body;

a latch carried by said connecting rod;

a pair of clasp members mounted on one of said closure members and movable laterally of one another into and out of engagement with said latch for disabling and enabling said relative movements of said closure members;

a pair of laterally opposed ears carried by said clasp members and extending therefrom to form a reentrant pocket between said ears; and

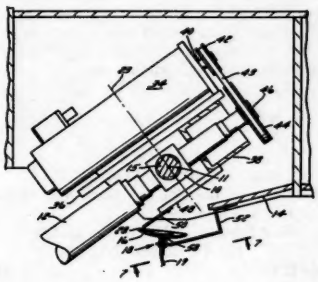
a release line having a plug releasably captured within said pocket and of such relative size as to move said ears and said clasp members away from one another by an amount sufficient to effect disengagement of said latch by said clasp members in response to the application of a force on said line sufficient to withdraw said plug from said pocket, whereby said closure members are enabled to effect closure of said hollow body.

5,487,315

ROTATIONAL MOTION LIMIT DETECTOR SYSTEM AND METHOD

Philip J. Finet, Milwaukee, and Edward Kirkham, Brookfield, both of Wis., assignors to Giddings & Lewis, Fond du Lac, Wis.

Filed Jul. 16, 1993, Ser. No. 93,232
Int. Cl.[6] B25G *3/00*
U.S. Cl. 73—865.9 **2 Claims**



1. A method for preventing a joint that can rotate around a pivot point from rotating beyond a limit of acceptable rotation, the method comprising:

supporting the joint so that the pivot point of the joint is stationary with respect to a support;

mapping a range of acceptable rotation for the joint on a spherical surface where a boundary of the spherical surface corresponds to the limit of acceptable joint rotation;

locating the spherical surface so that a center of a sphere defining the spherical surface substantially coincides with the pivot point of the joint;

monitoring a relative location of the boundary as the joint rotates in one or more directions along a path; and

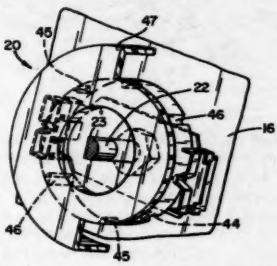
if the relative location of the spherical surface is such that continued rotation of the joint along the path will cause the relative location of the spherical surface to be displaced beyond the boundary, then stopping rotation of the joint along the path before the joint rotates beyond the limit of acceptable rotation.

5,487,316

IMPROVED CONTROL SELECTOR MECHANISM

Richard E. Hornung, Fisherville, and Patrick C. Luken, Simpsonville, both of Ky., assignors to General Electric Company, Louisville, Ky.

Continuation of Ser. No. 136,314, Oct. 13, 1993, abandoned. This application May 11, 1995, Ser. No. 439,464
Int. Cl.[6] G05G *1/10;5/06*
U.S. Cl. 74—527 **9 Claims**



1. In a control having an elongated adjustment shaft rotatable between a multitude of positions, the combination comprising:

a spring member including first and second flexible arms extending generally axially of said shaft on opposite sides of said shaft; each of said arms including a nose at a different position longitudinally of said shaft than the nose of said other arm engages said shaft;

a cam mounted for rotation with said shaft and including a generally cylindrical outer surface positioned between and overlapping said noses so that said noses are spring biased into engagement with said outer surface of said cam; and

a plurality of recesses angularly spaced apart about said outer surface of said cam; said plurality of recesses being arranged in pairs positioned on substantially opposite angular sides of said cam outer surface; one of each pair of recesses being longitudinally aligned with one of said noses and the other of each pair of recesses being longitudinally aligned with the other of said noses; and said cam outer surface having no recess angularly opposite and longitudinally aligned with each of said recesses;

whereby a detent is provided at each angular position of said shaft in which each recess of a pair of recesses is angularly aligned with the nose with which that recess also is longitudinally aligned and no detent is provided at the angular position of said shaft substantially one hundred and eighty degrees removed therefrom.

5,487,317

VEHICLE PEDAL COVER FOR USE WITH AN AUXILIARY PEDAL DEVICE

Alvin D. Richhart, 805 Jackson St., Sterling, Colo. 80751

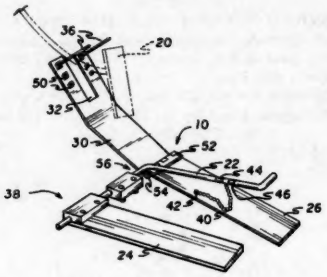
Filed Jan. 11, 1994, Ser. No. 180,075
Int. Cl.[6] G05G *1/16;1/18*
U.S. Cl. 74—562.5 **8 Claims**

5. An auxiliary pedal device for use with an accelerator pedal of a vehicle having a floor, said auxiliary pedal device comprising:

a lower plate having a first end and a second end, said lower plate being adapted for positioning beneath the accelerator pedal;

an upper plate having a first end and a second end, said first end of said upper plate being rotatably attached to said first end of said lower plate, said upper plate being selectively rotatable between a blocking position and an enabling position;

a shaft extending from said second end of said lower plate and contacting said second end of said upper plate when said upper plate is in said blocking position, said shaft preventing rotation of said upper plate toward said lower plate, thereby preventing depression of the accelerator pedal when said



upper plate is in said blocking position, said upper plate rotating away from said lower plate and adapted to rest on the floor of the vehicle when in the enabling position, thereby allowing depression of the accelerator pedal;

said auxiliary pedal device further comprising an auxiliary pedal and an arm, said arm adapted to engage the accelerator pedal of the vehicle, said auxiliary pedal adapted to be pivotally attached to the floor of the vehicle and being selectively movable between a working position and a non-working position, whereby said arm is adapted to depress the accelerator pedal upon displacement of said auxiliary pedal when said auxiliary pedal is in the working position;

a chain connecting said upper plate to said arm of said auxiliary pedal device, said chain being positioned to rotate said upper plate into the blocking position when said auxiliary pedal is moved to the working position.

5,487,318

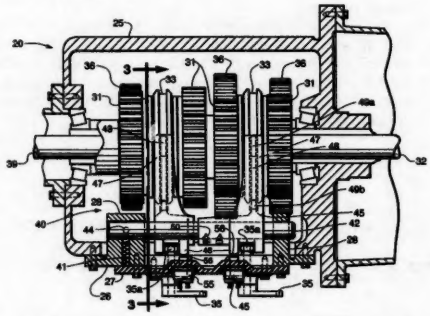
SHIFT FORK ACTUATED POSITION SENSOR

Allan N. Schott, Warren, Canada, assignor to New Holland North America, Inc., New Holland, Pa.

Filed Dec. 1, 1994, Ser. No. 353,222

Int. Cl.[6] F16H *57/02*

U.S. Cl. 74—606 R **6 Claims**



1. In a tractor transmission having a housing including a removable cover to provide access to the interior of said housing; an input shaft to provide a source of rotational power; an output shaft; a plurality of gears rotatably supported within said housing and operably connected to said input shaft and said output shaft for selectively varying a speed of operation of said output shaft for a given speed of operation of said input shaft; a shift fork assembly mounted within said housing and including at least one shift fork to effect a selectable shifting of said gears for interengagement therebetween in a predefined manner to provide said different speeds of operation of said output shaft, each said shift fork being selectively positionable in at least one engagement position in which said input and output shafts are operatively coupled and a neutral position in which said output shaft is disengaged from said input shaft; and a position sensor cooperatively associated with each said shift fork to sense the positioning of the corresponding said shift fork in the neutral position, the improvement comprising:

each said position sensor being mounted on a removable access cover to be located in direct contact with the corresponding said shift fork such that the movement of said corresponding shift fork into said neutral position effects a movement of a sensor switch to signal the status thereof.

5,487,319

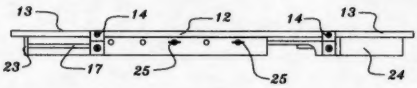
SAW GUIDE APPARATUS

Delbert J. Cody, 501 6th St., Cody, Wyo. 82414

Filed Oct. 22, 1993, Ser. No. 139,761

Int. Cl.[6] B26B *29/06*

U.S. Cl. 83—745 **3 Claims**



1. A saw guide apparatus, comprising,

a first table plate and; an expandable fence mounted to the first table plate, with the expandable fence having a fence first end and a fence second end, the fence first end and the fence second end each receive telescopingly a telescoping flange, a second table plate parallel and reciprocatably mounted to the first table plate with the first table plate parallel to the expandable fence,

and

a first gauge sector of a pie-shaped configuration mounted about a first pivot axle within the first table plate, with the first gauge sector having a first sector abutment plate mounted to a surface of the first gauge sector, and a second gauge sector having a pie-shaped configuration and a second pivot axle pivotally mounting the second gauge sector to the second table plate, with the second gauge sector having a second sector abutment plate mounted thereon.

5,487,320

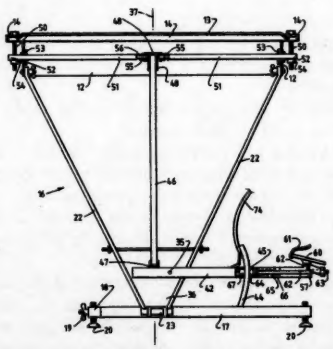
DRUM AND DRUM GAUGE

Marcus De Mowbray, 106 Douglas Flats, Marshalsea Road, London SE1 1JW, England

Filed Mar. 15, 1993, Ser. No. 31,759

Int. Cl.[6] G10D *13/02*

U.S. Cl. 84—413 **22 Claims**



1. A timpano type drum having a head, a cylindrical shell attached to and extending downwardly from the head, the shell having an open bottom, a plurality of tension bolts attached to the head, the drum head and shell being symmetrical about a drum

axis, a stand which is movable between a folded relatively flat condition and an erect three dimensional support position in which it is adapted to be connected to and support the shell and head with the drum axis substantially vertical, fastening means for attaching and detaching the stand to and from the shell, foot operated tuning means having an upper part fixed to the shell and to the tension bolts, and a lower part fixed to the stand, and coupling means for detachably coupling the upper and lower parts together in the erect condition of the stand with the head and shell supported thereon, such that movement of the lower part of the tuning means will adjust the tuning of the head via the tension bolts.

5,487,321

KEYBOARD LID, ITS OPEN-CLOSE STRUCTURE AND ARM MEMBERS FOR KEYED INSTRUMENT

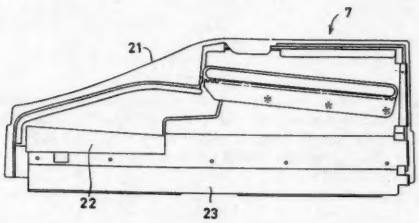
Masaji Kimura, and Yoshiaki Shimoda, both of Hamamatsu, Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Shizuoka, Japan

Continuation of Ser. No. 17,256, Feb. 12, 1993, Pat. No. 5,429,026. This application Dec. 9, 1994, Ser. No. 352,566

Claims priority, application Japan, Mar. 9, 1992, 4-021235 U; Mar. 9, 1992, 4-021236 U; Mar. 9, 1992, 4-021237 U

Int. Cl.[6] G01C *3/12;3/02;* **A47B** *51/00*

U.S. Cl. 84—423 R **2 Claims**



1. An apparatus for slidingly opening and closing a keyboard lid for covering a keyboard of a keyed instrument between an open position and a close position, said keyboard lid having a front end with a pair of opposite sides and a rear end with a pair of opposite sides, said apparatus comprising:

a pair of front guide projections projecting laterally from the opposite sides of the front end of the keyboard lid;

a pair of rear guide projections projecting laterally from the opposite sides of the rear end of the keyboard lid; and

a pair of side plates arranged on opposite sides of the keyboard, each one of said pair of side plates having a front guide groove engaging with a respective one of said pair of front guide projections and a rear guide groove engaging with a respective one of said pair of rear guide projections so as to slidably guide the keyboard lid between said open position and close position.

5,487,322

STORE EJECTOR

Glenn M. Rhodes, Bedfordshire, England, assignor to M L Aviation Limited, Berkshire, England

Filed Jun. 15, 1990, Ser. No. 563,915

Claims priority, application United Kingdom, Jul. 6, 1989, 8915503

Int. Cl.[6] B64D *1/02*

U.S. Cl. 89—1.56 **15 Claims**

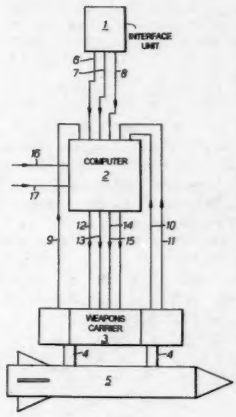
1. A store ejector comprising:

a fluid pressure operated ram for engaging and ejecting a store,

means for supplying fluid under pressure to said ram,

a throttle valve connected in series between said means for supplying and said ram,

programmable means for computing operatively connected to said throttle valve,



means operatively connected to said programmable means for monitoring a fluid pressure applied to said ram and inputting to said programmable means a signal representative of said fluid pressure, and

means operatively connected to said programmable means for monitoring extension of said ram and inputting to said programmable means a signal dependent on said extension,

said programmable means including means for outputting a control signal to said throttle valve for controlling said throttle valve in response to outputs of said means for monitoring a fluid pressure and said means for monitoring extension of said ram, thereby controlling said ram to apply a predetermined thrust profile to said store.

5,487,323

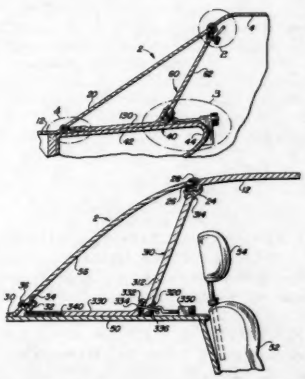
REMOVABLE BULLET RESISTANT APPARATUS FOR VEHICLES

James R. Madden, Jr., 4410 W. Acoma Dr., Glendale, Ariz. 85306-4506

Filed Jan. 20, 1995, Ser. No. 375,720

Int. Cl.[6] F41H *5/26*

U.S. Cl. 89—36.08 **24 Claims**



1. Bullet resistant apparatus for a vehicle having a top structure, a window cowling assembly, a front windshield disposed between the top structure and the window cowling assembly, and a dashboard assembly, comprising in combination;

a bullet resistant transparent panel secured to the vehicle between the top structure and the dashboard assembly; and

a plurality of layers of bullet resistant material secured to the transparent panel and disposed on the dashboard assembly between the transparent panel and the front windshield.

5,487,324

PNEUMATIC BOOSTER

Jean P. Gautier; Ulysse Verbo, both of Aulnay-Sous-Bois, and Miguel Perez, Argenteuil, all of, France, assignors to Allied Signal Europe Services Techniques, Drancy, France

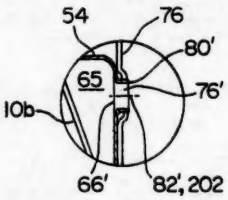
PCT No. PCT/FR93/00147, § 371 Date May 4, 1993, § 102(e) Date May 4, 1993, PCT Pub. No. WO93/19962, PCT Pub. Date Oct. 18, 1993

PCT Filed Feb. 12, 1993, Ser. No. 50,200

Claims priority, application France, Mar. 31, 1992, 92 03863

Int. Cl.[6] F15B *9/10*

U.S. Cl. 91—369.1 **8 Claims**



1. A pneumatic brake-booster for a vehicle comprising an engine compartment and a passenger space which are separated by an apron, the booster comprising a casing formed of a front shell and of a back shell and inside which is located a piston comprising of a back tubular part and supporting a skirt which, with the aid of an unrolling membrane, defines a first chamber connected permanently to a source of partial vacuum and a second chamber connected selectively to a one of the front chamber and to atmosphere by valve means actuated by a control rod, and the casing comprising means for securing the booster to the apron of the vehicle, the booster comprising a third chamber connected permanently to atmosphere through a filter element and selectively to the second chamber by the valve means, the third chamber being partially delimited by a bellows secured in leaktight manner to the control rod, by a back face of the back shell and by a front face of a housing secured in leaktight manner to the casing of the booster and onto which the bellows is secured in leaktight manner, the third chamber being formed between the back shell of the booster and the apron of the vehicle, wherein the housing comprises a cylindrical peripheral part whose diameter is substantially equal to that of the casing of the booster, and formed with an aperture associated with the filter element disposed in the third chamber in the immediate vicinity of the aperture, the third chamber having a volume at least equal to a minimal volume of the second chamber, and the means for securing the booster to the apron of the vehicle passing in leaktight manner through the third chamber.

5,487,325

VEHICLE BRAKE SERVO BOOSTER WITH TRACTION CONTROL MODE

John P. Bayliss, Worcestershire, and Sean Byrnes, Birmingham, both of, England, assignors to Lucas Industries, England

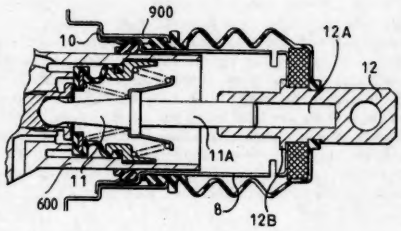
PCT No. PCT/GB92/00685, § 371 Date Oct. 8, 1993, § 102(e) Date Oct. 8, 1993, PCT Pub. No. WO92/18366, PCT Pub. Date Oct. 29, 1992

PCT Filed Apr. 14, 1992, Ser. No. 133,021

Claims priority, application United Kingdom, Apr. 15, 1991, 9107940

Int. Cl.[6] F15B *9/10*

U.S. Cl. 91—376 R **5 Claims**



1. A brake servo booster for use in a vehicle hydraulic braking system comprising a servo piston which is connected to an output member and to which a supply of air is controlled by a valve mechanism which includes a reciprocable valve element connected to a force input member actuated by a driver-operated control device, the force input member including two parts of which a first one is connected, in use, to the driver-operated control device and the second one to the valve element, the arrangement being such that operating force applied to the control device is transmitted through both of said first and second parts of the input member by a direct mechanical connection therebetween to the valve element, whilst operation of the booster in the traction control mode is permitted by the second part of the force input member moving relative to the first part.

5,487,326

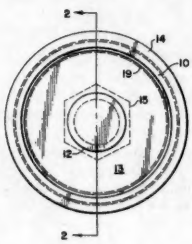
HYDRAULIC CYLINDER WITH END CLOSURE ASSEMBLY

Carl H. Owens, 4466 McGirts Blvd., Jacksonville, Fla. 32210

Continuation of Ser. No. 646,192, Jan. 28, 1991, abandoned. This application Jul. 20, 1992, Ser. No. 917,784

Int. Cl.[6] F01B *29/00;* **F16J** *15/18*

U.S. Cl. 92—128 **11 Claims**



1. In a hydraulic cylinder having a cylindrical barrel with a closed end and an open end, said barrel having an interior bore uniform throughout the length thereof between said closed end and closely adjacent to said open end, a piston slidably disposed within said barrel, a rod gland disposed within and closing said open end of said barrel and having a small central passageway spaced from said barrel and aligned with a longitudinal axis of said barrel, an elongated piston rod spaced from said barrel and slidably disposed in said passageway and having one end attached to said piston and an exposed end external of said barrel, said rod gland carrying sealing means exposed in said small passageway and engaged with said piston rod against leakage for sealing therebetween, said rod gland carrying other sealing means exposed to and engaged with said barrel for scaling against leakage therebetween, said rod gland forming a directly engaged stop for said piston when said piston rod is fully extended, the improvement comprising a rod gland retainer assemble including a gland retainer welded outwardly of and to said barrel in the absence of any screw thread connection therebetween, said gland retainer having an internal circumferential ledge, and said assembly further including a split ring spring retainer removably inserted between said ledge and said rod gland for bearing against said rod gland and solely holding said rod gland in place.

5,487,327
BOOSTER HOUSING, ESPECIALLY FOR VEHICLE BRAKE SYSTEMS, AND METHOD OF ASSEMBLING SUCH AS BOOSTER HOUSING

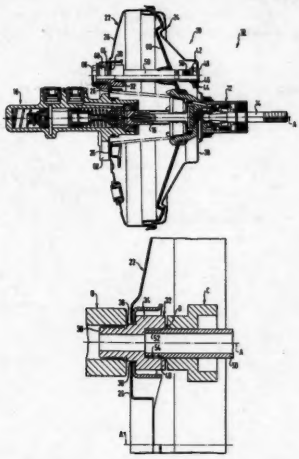
Peter Schlüter, Kammerforst, and Lothar Zeuner, Steineroth, both of, Germany, assignors to Lucas Industries Public Limited Company, Solihull, Great Britain

Filed Aug. 2, 1994, Ser. No. 284,123

Claims priority, application Germany, Sep. 24, 1993, 43 32 611.0

Int. Cl.[6] F01B *11/02;* **F16J** *10/00*

U.S. Cl. 92—128 **5 Claims**



1. A booster housing, especially for vehicle brake systems, comprising:

two housing bottoms which are disposed at either side of a movable partition and are provided with fastening holes,

connecting members which are mounted on at least one of the housing bottoms and are tightly crimped with the respective housing bottom around the fastening holes thereof, and

spacers which extend between the two housing bottoms as well as through the movable partition and are fixed to the connecting members, wherein each of the connecting members has a recess into which an end portion of the associated spacer is inserted, and the connecting member crimped.

4. A method of assembling a booster housing, for vehicle brake systems, said booster housing having two housing bottoms disposed at either side of a movable partition and provided with fastening holes, comprising the steps of:

inserting an end portion of a spacer into a recess of a connecting member,

passing the connecting member through one of the fastening holes in the housing bottoms in such a way that a collar formed on the connecting member extends through the fastening hole, and

simultaneous crimping the connecting member with the housing bottom and the spacer.

5,487,328
TOASTER

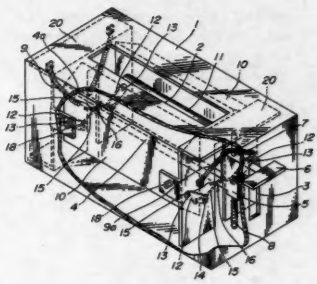
Tadao Fujii, Tokyo, Japan, assignor to Yamada Electric Ind. Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1995, Ser. No. 417,003

Int. Cl.[6] A47J *37/08*

U.S. Cl. 99—390 **6 Claims**

1. A toaster having a toaster body, and a bread inlet port formed of a longitudinally extended opening opened at the top portion of said toaster body, comprising;



a pair of heating members respectively including heaters being parallely installed to a lower portion of said inlet port at adjacent a lengthwisely extended side wall of said toaster body horizontally movably toward and apart therefrom,

a carriage member downwardly movably installed to the bottom portion of said inlet port to receive the sliced bread inserted therefrom, and

a space regulating member including a link of which a first end being pivotably fixed to the widthwisely extended side surface of said heating member at adjacent gravity center thereof and a second end being pivotably supported by said toaster body, and a spring attached to the position where said second end of the link being supported and linearly extended toward the bottom of said carriage member to receive said carriage member moved toward said spring, said link being pivotably moved cooperating with the spring force of said spring with the reception of said carriage member to horizontally move said heating member toward and apart from the lengthwisely extended side wall of said toaster body.

5,487,329
COOKING OR BOILING POT

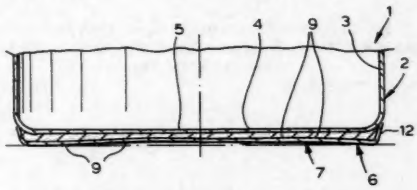
Harald Fissler, Idar-Oberstein, Germany, assignor to Vesta AG & Co. OHG, Idar-Oberstein, Germany

Filed Apr. 12, 1995, Ser. No. 422,498

Claims priority, application Germany, Apr. 15, 1994, 44 12 944.0

Int. Cl.[6] A47J *27/00;* **B32B** *15/00*

U.S. Cl. 99—403 **15 Claims**



1. A bottom-heated utensil comprising:

a container having a container base of circular configuration composed of austenitic sheet steel and a container casing extending upwardly from said container base;

a thermal distribution plate coextensive with said container base and affixed to an external surface thereof continuously over all of said surface;

a metal plate cover member overlying said plate and bonded thereto, said cover member having a circular discoid cover base provided with a plurality of cover base recesses distributed over an entire surface of said cover base; and

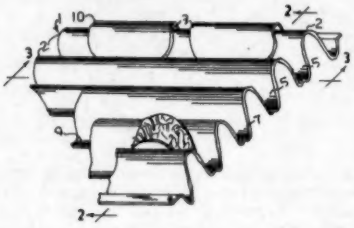
insets fitted into said recesses and bonded to said cover member, said insets collectively forming another member, one of said members being composed of austenitic sheet steel and the other of said members being composed of ferromagnetic sheet steel.

5,487,330

TACO BAKING AND SERVING PAN

Audrey J. Mooney, 2511 N. Riverside Dr., Pompano Beach, Fla. 33062

Filed Feb. 21, 1995, Ser. No. 391,214
Int. Cl.[6] A47J *37/01*
U.S. Cl. 99—425 **9 Claims**



1. A taco pan for holding tacos open while baking and for supporting tacos from below while filling and serving, the pan comprising:

a single sheet formed into the following configuration;

a plurality of elongate parallel upstanding tapered ridges, each ridge arranged for supporting and holding open an inverted taco shell thereon while baking;

at least one trough defined by a pair of adjacent ridges, the trough having a length greater than the length of a taco shell and having a bottom with a rounded configuration to generally conform to the normal bending radius of a formed taco shell for supporting an upright shell therein during filling and serving; and

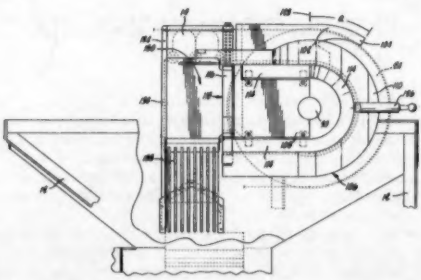
a sloping stop element rising from the bottom of the trough at each end thereof to be capable of containing within the trough the filled taco and any contents that might spill therefrom, the sloping stop element also being capable of gradually lifting the filled taco as it is moved to the end to thereby enable a person to lift the filled taco from underneath.

5,487,331

FRUIT JUICE EXTRACTING MACHINE

Ronald C. Bushman, Brea; William E. Harris, Jr., Fontana, both of Calif., and Roger N. Foch, Lake Alfred, Fla., assignors to Automatic Machinery and Electronics, Inc., Covina, Calif.

Division of Ser. No. 157,918, Nov. 24, 1993, Pat. No. 5,408,923. This application Apr. 10, 1995, Ser. No. 419,190
Int. Cl.[6] A23N *1/00*
U.S. Cl. 99—504 **11 Claims**



1. In a fruit juice extracting machine of the type having a pair of opposing endless cup chains extending around a reamer wheel rotatable about a horizontal axis and having a plurality of spaced apart reamers for reaming fruit halves contained in cups on the cup chains, with a peel cnute positioned in between the cup chains and behind the reamer wheel, for collecting and channeling fruit peels ejected from the cups, the improvement comprising:

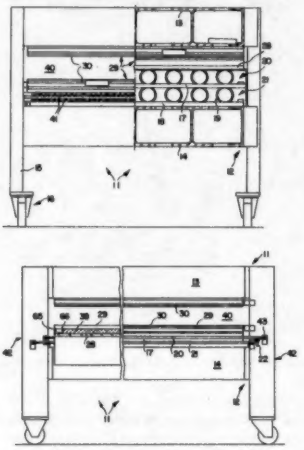
a bulkhead panel separating the peel chute from the reamer wheel.

5,487,332

PLATEN PRESS FOR WOODWORKING

Gerald Handke, Pfalzgrafenweiler, Germany, assignor to Gottfried Joos Maschinenfabrik GmbH & Co., Pfalzgrafenweiler, Germany

Filed May 2, 1994, Ser. No. 236,640
Claims priority, application Germany, May 19, 1993, 9307632 U
Int. Cl.[6] B30B *15/34*
U.S. Cl. 100—93 P **11 Claims**



1. A platen press, comprising:

(a) at least one vertically movable press plate;

(b) a press drive for moving said press plate, and comprising at least two overlying rows of laterally disposed, pneumatically inflatable hoses, the hoses of each row residing adjacent to each other; and

(c) at least one vertically movable, rigid intermediate plate interposed between the at least two hose rows, and extending over the full width of the hose rows in a direction transverse to the hoses.

5,487,333

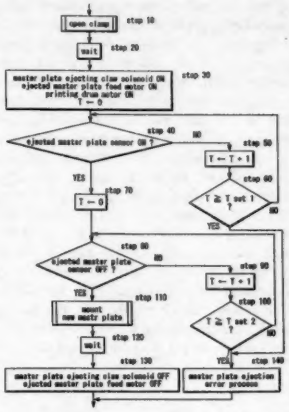
STENCIL PRINTING DEVICE EQUIPPED WITH A STENCIL MASTER PLATE EJECTING DEVICE

Susumu Oshio, and Tadayuki Igarashi, both of Tokyo, Japan, assignors to Riso Kagaku Corporation, Tokyo, Japan

Filed Mar. 1, 1994, Ser. No. 203,577
Claims priority, application Japan, Mar. 5, 1993, 5-045418
Int. Cl.[6] B41L *13/06*
U.S. Cl. 101—116 **8 Claims**

1. A stencil printing device equipped with a master plate ejecting device for removing a stencil master plate mounted around an outer circumferential surface of a printing drum and conveying it to an ejected master plate receiving unit, comprising:

a singular stencil master plate detecting sensor for detecting presence or absence of a stencil master plate in a path for conveying a stencil master plate to said stencil master plate receiving unit; and

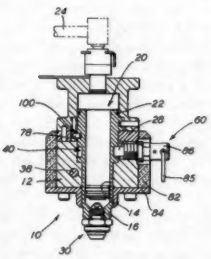


control means for monitoring if a first change of a state of said stencil master plate detecting sensor from a state indicating absence of a stencil master plate to a state indicating presence of a stencil master plate is followed within a prescribed time period by a second change of a state of said stencil master plate detecting sensor from a state indicating presence of a stencil master plate to a state indicating absence of a stencil master plate so that a start of a next operation is permitted when such a sequence of said first change and said second change of a state of said stencil master plate detecting sensor takes place, and a start of a next operation is otherwise prohibited as being a case of a failure to properly eject a stencil master plate.

5,487,334
APPARATUS FOR PRODUCING CHARACTERS ON A PRODUCT

Ralph M. Chew, New Kensington, and Robert W. Ekis, Pittsburgh, both of Pa., assignors to Matthews International Corporation, Pittsburgh, Pa.

Filed Feb. 25, 1993, Ser. No. 22,557
Int. Cl.[6] B05C *17/06*
U.S. Cl. 101—126 **14 Claims**



1. A marking tip assembly for applying a predetermined character to a predetermined surface of a predetermined article, said marking tip assembly comprising:

(a) a body portion engageable with one end of an ink cartridge assembly, said body portion having an aperture formed therethrough substantially along a longitudinal axis thereof;

(b) a porous disk member disposed at one end of said body portion;

(c) a screen means disposed over said porous disk member for providing said predetermined character to be applied to said predetermined surface of said predetermined article;

(d) means engageable with said screen means for holding said screen means in proper orientation over said porous disk member;

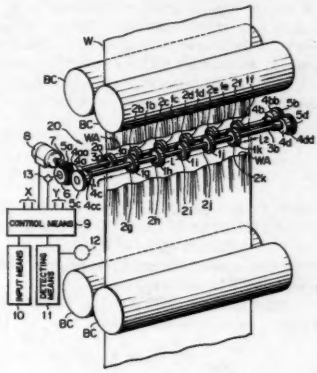
(e) a plunger means mounted for reciprocal movement within said aperture for enabling a predetermined amount of melted ink to be forced through both said porous disk member and said screen means; and

(f) a sealing means disposed adjacent one end of said plunger means for sealing an ink supply to said porous disk member.

5,487,335
WIDTH ADJUSTING DEVICE AND METHOD FOR A PAPER WEB, AND LITHOGRAPHIC ROTARY PRESS HAVING SAME

Takashi Iijima, Yokosuka, and Hideo Ohta, Tokyo, both of, Japan, assignors to Kabushikigaisha Tokyo Kikai Seisakusho, Tokyo, Japan

Continuation of Ser. No. 889,906, May 29, 1992, abandoned.
This application Aug. 17, 1994, Ser. No. 291,470
Claims priority, application Japan, Dec. 26, 1991, 3-357580
Int. Cl.[6] B41F *5/06*
U.S. Cl. 101—181 **3 Claims**



1. A printing apparatus through which a dampened paper web travels, said printing apparatus comprising:

first and second printing sections which each print an image on said dampened paper web as said dampened paper web travels through said first and second printing sections;

means for variably changing a width of said dampened paper web so that said image formed on said dampened paper web at said first printing section and said image formed on said dampened paper web at said second printing section are properly aligned with each other, said changing means being disposed between said first and second printing sections;

wherein said changing means includes first and second contact devices disposed at opposite first and second surfaces of said dampened paper web such that said dampened paper web travels between said first and second contact devices, said first and second contact devices respectively having a plurality of first and second contact members disposed thereon along an axial direction such that said plurality of first contact members of said first contact device are staggered relative to said plurality of second contact members of said second contact device thereby producing an alternating sequence of individual first and second contact members as viewed along said axial direction;

further comprising a plurality of rotatable cylinders which drive said dampened paper web, said axis of rotation of each of said rotatable cylinders being approximately parallel to said axial direction;

wherein said changing means includes means for moving said first plurality of contact members into and out of contact with

said first surface and for moving said second plurality of contact members into and out of contact with said second surface, and when said first and second plurality of contact members are in contact with said dampened paper web, said width of said dampened paper web is reduced as compared to when said first and second plurality of contact members are not in contact with said dampened paper web;

further comprising means for controlling said moving means such that said width of said dampened paper web can be variably changed in response to an extent of movement of said first and second plurality of contact members into contact with said dampened paper web;

further comprising an input device through which information concerning the dampened paper web is provided to said controlling means, said information being used by said controlling means to determine said extent of movement;

wherein said first and second plurality of contact members each are a roller member having a circumferential contact surface in elastic contact with said dampened paper web;

wherein said first contact device includes a first shaft on which said first plurality of contact members are mounted, said second contact device includes a second shaft on which said second plurality of contact members are mounted and said changing means further includes first, second, third and fourth rotatable members each having a sleeve projecting from a surface thereof at an eccentric position relative to an axis of rotation of said rotatable member, first and second ends of said first shaft are respectively disposed in said sleeves of said first and second rotatable members and first and second ends of said second shaft are respectively disposed in said sleeves of said third and fourth rotatable members.

5,487,336

SUSPENSION FOR A DEVICE SERVING AS A GUARD IN FRONT OF THE PRINTING-UNIT CYLINDERS OF A PRINTING MACHINE

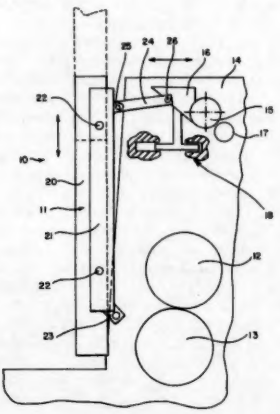
Claus Simeth, Geisenheim, Germany, assignor to MAN Roland Druckmaschinen AG, Germany

Filed Mar. 24, 1995, Ser. No. 410,347

Claims priority, application Germany, Mar. 25, 1994, 44 10 305.0

Int. Cl.[6] B41F *33/14*

U.S. Cl. 101—216 **11 Claims**



1. A printing machine comprising:

a frame; a plate cylinder supported within said frame; an ink fountain for storing printing ink; transfer rolls for transferring printing ink from said ink fountain to said plate cylinder, said transfer rolls including an ink fountain roller, said ink fountain being moveable between an operating position in which said ink fountain roller communicates with said ink fountain and a throw-off position in which said ink fountain roller does not communicate with said ink fountain; a guard mechanism for impeding access to said plate cylinder and ink fountain from outside of said printing machine, said guard mechanism including a guard plate, said guard plate being movable independently of said ink fountain between a first position which impedes access to the interior printing machine and the plate cylinder and ink fountain located therein and a second position which permits access to an interior of said printing machine and said plate cylinder and ink fountain, and said guard plate being connected to said ink fountain such that upon movement of said ink fountain to said throw-off position said guard plate is simultaneously moved to a position which prevents the possibility of said ink fountain from interfering with movement of said guard plate between its first and second positions and which prevents the possibility of said guard plate from interfering with movement of said ink fountain from said operating position to said throw-off position.

5,487,337

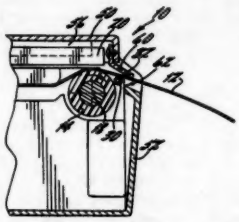
METHOD AND APPARATUS FOR PRINTING LINERLESS MEDIA HAVING AN ADHESIVE BACKING

David M. Uland, Mecklenburg County, N.C., assignor to Data-South Computer Corporation, Charlotte, N.C.

Continuation-in-part of Ser. No. 243,198, May 16, 1994. This application Aug. 11, 1994, Ser. No. 288,958

Int. Cl.[6] B41F *1/08*

U.S. Cl. 101—288 **21 Claims**



1. An apparatus for printing a linerless label strip backed with a tacky adhesive which is supplied in a wound roll, the printing apparatus comprising:

a support frame;

a holder mounted to said frame for rotatably supporting the wound roll of the label strip;

a platen roller rotatably mounted to said frame for supporting the label strip, said platen roller defining a platen roller axis;

means for printing indicia on one side of the label strip and including a print head positioned in alignment with said platen roller such that the label strip is adapted to extend between said platen roller and said print head;

means for rotating said platen roller such that the label strip is thereby advanced between said platen roller and said print head;

stripping means, mounted downstream of said print head and adjacent said platen roller, for directly contacting the tacky adhesive backing of a portion of the adhesive backed label strip and for providing a lifting force to the label strip to thereby strip a portion of the adhesive backed label strip from said rotating platen roller such that the label strip, having indicia imprinted on one side thereof, can be withdrawn from the printing apparatus, said stripping means comprising a stripping roller rotatably mounted to said support frame, said stripping roller defining a stripping roller axis extending in a parallel relationship to the platen roller axis defined by said platen roller,

wherein said print head is mounted vertically above said platen roller, and wherein the uppermost portion of the peripheral surface of said stripping roller is vertically positioned no

higher than the uppermost portion of the peripheral surface of said platen roller; and

a tear bar for emitting at least one label to be separated from the label strip after indicia has been imprinted thereon, said tear bar being mounted downstream of said stripping roller such that a leasing edge portion of the label strip extends over said stripping roller after the label has been separated from the label strip.

5,487,338

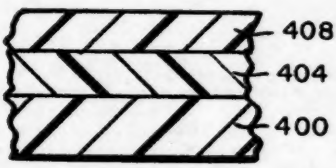
LITHOGRAPHIC PRINTING PLATES FOR USE WITH LASER-DISCHARGE IMAGING APPARATUS

Thomas E. Lewis, E. Hampstead; Michael T. Nowak, Leominster; Kenneth T. Robichaud, Fitchburg, all of Mass., and Kenneth R. Cassidy, Goffstown, N.H., assignors to Presstek, Inc., Hudson, N.H.

Division of Ser. No. 62,431, May 13, 1993, Pat. No. 5,339,737, which is a continuation-in-part of Ser. No. 917,481, Jul. 20, 1992, Pat. No. 5,385,092. This application Aug. 16, 1994, Ser. No. 291,410

Int. Cl.[6] B41N *1/08*

U.S. Cl. 101—454 **26 Claims**



1. A lithographic printing member directly imageable by laser discharge, the member comprising:

a. a first durable, solid organic polymer layer that is oleophobic or hydrophilic;

b. a solid oleophilic substrate underlying the first layer; and

c. an imaging-radiation-reflective layer disposed between the first layer and the substrate;

wherein

d. the first layer is characterized by ablative absorption of imaging radiation and the substrate is not.

5,487,339

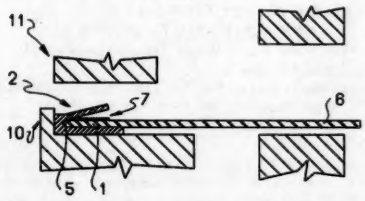
METHOD FOR FASTENING A HOLDING BAR TO A PRINTING BLANKET

Walter Breventani, S. Giuliano Milanese, and Natale Fossati, Cernusco sul Naviglio, both of, Italy, assignors to Reeves Brothers, Inc., Spartanburg, S.C.

Filed Feb. 2, 1994, Ser. No. 190,822

Int. Cl.[6] B41F *1/28*

U.S. Cl. 101—483 **20 Claims**



1. A method for securing a mounting bar to a printing blanket which comprises:

applying a strip of hot melt adhesive along and adjacent an edge of the blanket;

placing the mounting bar along the edge of the blanket upon the strip to form an assembly;

applying heat and pressure to the assembly for a sufficient time to melt the adhesive and provide a substantially uniform thickness of such adhesive between the bar and blanket; and

allowing the melted adhesive to solidify and

securely attach the mounting bar to the blanket.

5,487,340

CARD PRINTING METHOD, ORIGINAL POSITIONING HOLDER, AND CAR PRINTING PAPER

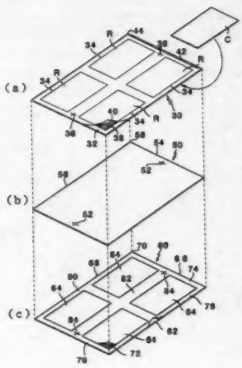
Hirokazu Kanai, Tokyo, Japan, assignor to Omron Corporation, Kyoto, Japan

Division of Ser. No. 59,671, May 12, 1993, Pat. No. 5,337,669. This application Jul. 5, 1994, Ser. No. 270,587

Claims priority, application Japan, May 18, 1992, 4-124827; Aug. 25, 1992, 4-059787 U

Int. Cl.[6] B41M *1/12*

U.S. Cl. 101—486 **11 Claims**



1. An original positioning holder for card printing, comprising:

a base sheet having a size suitable for feeding into a master plate making unit;

an original set up position designating mark provided on a surface of said base sheet for designating an original set up region for a card-like original; and

a registration mark provided outside said original set up region designated by said original set up position designating mark at a position having a prescribed positional relationship to said original set up position designating mark.

5,487,341

SPIKER WITH HOLE SENSING

G. Robert Newman, West Columbia, and Edwin H. Reeves, Columbia, both of S.C., assignors to Harsco Corporation, Wormleysburg, Pa.

Filed Jun. 27, 1994, Ser. No. 265,834

Int. Cl.[6] E01B *29/00*

U.S. Cl. 104—17.1 **25 Claims**

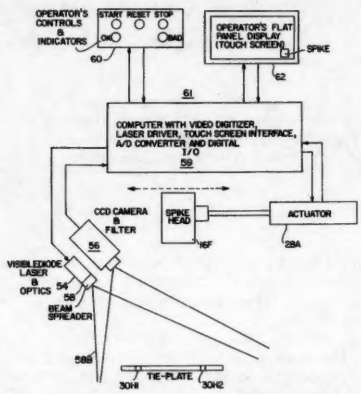
1. A spiker vehicle comprising:

a vehicle frame with four rail engagement wheels;

a first spiker supported by said vehicle frame;

an actuator operably connected to said first spiker to move said first spiker in a rail direction; and

a hole sensing system supported by said vehicle frame and operably connected to control said actuator so as to automati-



cally move said first spiker into a spiking position above a spike hole in a tie plate on a tie of a railroad bed; and

wherein said hole sensing system includes a laser operable to generate a beam and a beam spreader operable to spread the beam so as to apply a line of light having a sufficient length in a rail direction as to simultaneously illuminate two spike holes both on a given side of an adjacent rail, the two spike holes being offset in the rail direction on a tie plate, a detector for detecting light from the laser as reflected by a tie plate, and a hole recognizer connected to said detector for processing signals from said detector and generating a FOUND signal upon determining the locations of said two spike holes.

5,487,342

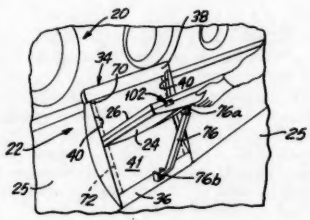
STOWAWAY TABLE

Henry J. Mack, 82 Firtree Rd., Levittown, Pa. 19056

Filed Sep. 26, 1994, Ser. No. 312,474

Int. Cl.[6] A47B *23/00*

U.S. Cl. 108—42 **34 Claims**



1. A stowaway table for use such as in closely confined areas such as the interior of an airplane comprising

a support frame defining a table storage area,

a guide mounted to the frame, having upper and lower ends,

a table leaf having upper and lower ends and dimensioned for being contained within said table storage area,

means mounting said table leaf at its lower end for movement along said guide, wherein said table leaf is positioned in a stowed position within said table storage area when the mounted end of the table leaf is at the lower guide end, and said table leaf is horizontally and outwardly extending from said support frame and in a raised position when the mounted end of the table leaf is at the upper end of the guide, and

a strut having opposing ends, and pivotally mounted at one end to said frame and mounted at the other end to said upper end of said table leaf, said strut including means mounted on the strut and interconnecting said leaf for biasing said upper end of said table leaf upward and outward from said frame and table storage area a sufficient distance when said table leaf is initially to be raised to allow movement of said table lower end upward along said guide and pivoting movement of said table leaf into a horizontal, raised position, wherein said strut aids in supporting the table leaf when it is positioned in its horizontally raised position.

5,487,343

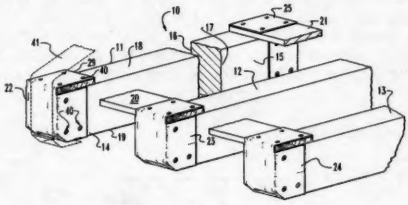
PALLET/SKID SHIPPING PLATFORM

Stewart A. Phillips, 9677 Hillview Ct., Newburgh, Ind. 47630

Filed Jun. 20, 1994, Ser. No. 262,626

Int. Cl.[6] B65D *19/00*

U.S. Cl. 108—51.1 **7 Claims**



1. A storage platform comprising:

a plurality of parallel wooden elongated runners extending in a first direction, each of said runners including a pair of ends with said ends including one end and an opposite end and further with parallel opposite side surfaces extending therebetween and a top surface extending perpendicularly to and between said side surfaces;

a plurality of top wooden elongated deck boards each mounted to and extending perpendicularly across said runners at said ends and resting atop said top surface; and,

a plurality of brackets mounted to said runners at said ends with each of said brackets separated apart from the remaining of said brackets and with each bracket mounted to a separate single end of a separate single runner, said brackets each including a pair of vertical side walls positioned adjacent and fixedly attached to said side surfaces and further including an end wall joined to and positioned perpendicularly to and between said side walls with said brackets further including a top wall spaced apart from but attached by said end wall to said vertical side walls forming a top slot into which a deck board extends being fixedly attached thereto, said top wall cantileveredly joined to said end wall and extending therefrom in the same direction as said first direction from said end wall and said one end toward said opposite end with said top wall attached directly to said deck boards directing any lifting force applied to said deck boards through said top wall directly to said end wall and said ends of said runners.

5,487,344

BLOCK PALLET CONSTRUCTION USING CORRUGATED SHEET MATERIALS

Joel P. Hutchison, San Antonio, Tex., assignor to Miriam M. Benson, San Antonio, Tex.

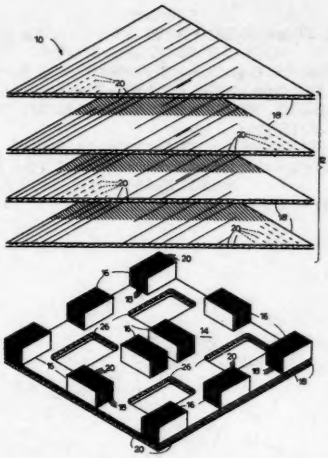
Continuation-in-part of Ser. No. 178,835, Jan. 7, 1994. This application Feb. 18, 1994, Ser. No. 198,635

Int. Cl.[6] B65D *19/00*

U.S. Cl. 108—51.3 **10 Claims**

1. A shipping pallet constructed of multiple laminates of corrugated sheet material and formed of components comprising:

a top sheet and a bottom sheet spaced apart from said top sheet, with said top sheet and said bottom sheet each comprising a plurality of corrugated sheets each having a first wall, a second wall, and a plurality of corrugation flutes disposed



therebetween, said first wall of each of said corrugated sheets being of a heavier weight than said second wall; and

a plurality of blocks sandwiched between said first sheet and said second sheet, with at least said blocks being constructed of plural reverse laminations of corrugated sheets, said corrugated sheets each having a first wall, a second wall, and a plurality of corrugation flutes disposed therebetween said first wall of each of said corrugated sheets being of a heavier weight than said second wall, with said first wall of one of said corrugated sheets being adhesively attached to said first wall of another of said corrugated sheets to provide a reverse lamination, whereby;

at least said blocks of said shipping pallet are substantially free from warps or curvature by means of said reverse lamination of said corrugated sheets used in the construction of said shipping pallet.

5,487,345

PARAMETRICALLY WRAPPED PALLET MEMBER AND PALLET CONSTRUCTED THEREOF

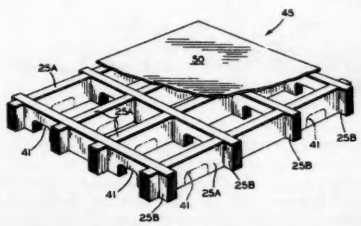
Ken N. Winebarger, Lakeland, Fla., and Stanley M. Lee, Tomball, Tex., assignors to Unipal International Corporation, Lakeland, Fla.

Continuation-in-part of Ser. No. 40,338, Mar. 30, 1993, Pat. No. 5,357,875, which is a continuation of Ser. No. 792,182, Nov. 14, 1991, Pat. No. 5,218,913, which is a continuation-in-part of Ser. No. 631,714, Dec. 21, 1990, abandoned, which is a continuation of Ser. No. 321,022, Mar. 9, 1989, Pat. No. 4,979,446. This application Jul. 5, 1994, Ser. No. 256,223

The portion of the term of this patent subsequent to Dec. 25, 2007, has been disclaimed.

Int. Cl.[6] B65D *19/00*

U.S. Cl. 108—51.3 **30 Claims**



5. A pallet of corrugated material for the shipment and storage of a load of goods stacked therein, comprising:

(a) a plurality of elongated base members laid longitudinally in parallel, spaced positions; and

(b) a plurality of elongated deck members laid laterally in parallel, spaced positions and intersecting said base members at longitudinally, displaced positions thereon to interconnect the same to form a free-standing lattice structure; said base and deck members each having top surfaces located in a common upper horizontal plane to provide the level upper platform, and bottom surfaces located in a common lower horizontal plane to provide a stable, floor contacting base;

wherein each of said base and deck members is a parametrically wrapped pallet member consisting of a closely-packed core of adjacent vertically oriented panels surrounded by a wrapping means of parametric, horizontally and vertically running panels surrounding said closely-packed core on all four sides.

5,487,346

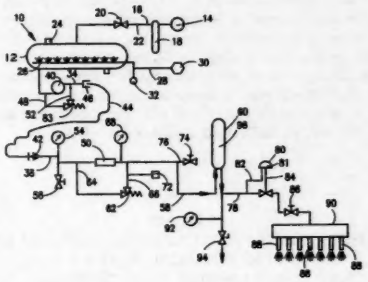
SOIL INJECTION SYSTEM

Donald K. Taylor, 1007 Tiki Dr., Galveston, Tex. 77554

Filed Jan. 10, 1994, Ser. No. 179,249

Int. Cl.[6] A01G *25/16;* **A01C** *23/04*

U.S. Cl. 111—127 **18 Claims**



1. A fluid injecting system for injecting fluid into soil, the system comprising

a tank for receiving and from which is discharged the fluid,

mixing means in the tank for mixing the fluid,

a transfer pump in fluid communication with the mixing tank,

a pressure pump, the transfer pump in fluid communication with the pressure pump for pumping fluid to sequencing pumping means,

sequencing pumping means for providing sequential pulses of fluid to a nozzle apparatus,

nozzle apparatus with at least one nozzle through which fluid is injected into the soil, the sequencing pumping means in fluid communication with the nozzle apparatus,

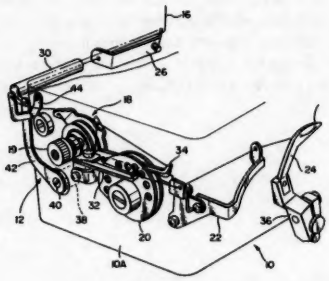
accumulator apparatus for accumulating a charge of fluid pumped thereto from the pressure pump, and

the sequencing pumping means having sensing apparatus to sense a pressure level of the charge of fluid in the accumulator apparatus, and the sequencing pumping means having opening apparatus which opens when a pre-set pressure level of the charge of fluid is sensed, permitting the charge of fluid to flow to the nozzle apparatus.

5,487,347
LOOPER THREAD PAYING-OUT APPARATUS FOR SEWING MACHINE

Satoshi Kogawara, Tokyo, Japan, assignor to Juki Corporation, Tokyo, Japan

Filed Nov. 16, 1994, Ser. No. 340,636
Claims priority, application Japan, Nov. 17, 1993, 5-288109
Int. Cl.[6] D05B 49/00;47/00
U.S. Cl. 112—242 6 Claims

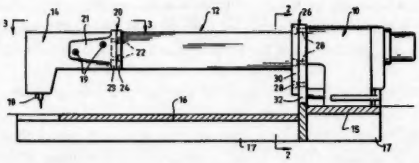


1. A looper thread paying-out apparatus of a sewing machine for feeding a thread from a bobbin through a thread tensioner and a thread take-up into a looper which is movable through a stitching stroke, said apparatus being characterized in that upstream of said thread tensioner an auxiliary paying-out apparatus is arranged for paying out a portion of thread for a length of one stitch just before each stitching stroke of the looper, said auxiliary paying-out apparatus includes an auxiliary thread take-up member pivotably mounted to a feed rock shaft for driving a horizontal cloth feed mechanism and a thread guide, said auxiliary thread take-up member and said thread guide cooperating to draw out and accumulate a portion of thread for a length of one stitch just before thread is drawn out through said thread tensioner into the looper.

5,487,348
SEWING MACHINE WITH ELONGATED ARM AND STRENGTHEING PLATE

John Cordes, Lot 7 Lindaway Place, Tullamarine, Victoria 3043, Australia

Filed Dec. 23, 1993, Ser. No. 173,365
Claims priority, application Australia, Dec. 23, 1992, PL6568
Int. Cl.[6] D05B 73/00
U.S. Cl. 112—259 7 Claims

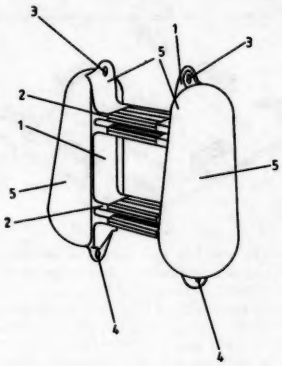


1. A sewing machine comprising: a sewing head; an elongated arm coupled to one end of said sewing head, said elongated arm having another end; a body associated with motor means for driving the sewing head, said body being coupled to the other end of said elongated arm; a pair of bed support rails securely attached to said body; and a strengthening plate clamped between said elongated arm and said body, said strengthening plate extending downwardly from between said elongated arm and body and being also clamped between said pair of bed support rails.

5,487,349
DEVICE FOR COMBINED USE AS A LADDER, FENDER AND LIFE-BUOY FOR BOATS

Leif Andreassen, Fagerliveien 3, N-9007 Tromsø, Norway

PCT No. PCT/NO92/00160, § 371 Date Mar. 30, 1994, § 102(e) Date Mar. 30, 1994, PCT Pub. No. WO93/07050, PCT Pub. Date Apr. 15, 1993
PCT Filed Sep. 24, 1992, Ser. No. 211,467
Claims priority, application Norway, Jan. 2, 1991, 913879
Int. Cl.[6] B63B 59/02
U.S. Cl. 114—219 18 Claims

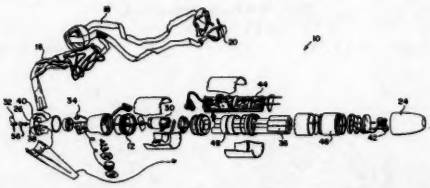


1. A device for use as a combined ladder and fender for boats comprising: two parallel side members, each side member including an inner surface and an outer surface, each side member also including an upper extremity and a lower extremity separated from each other by a fixed length, at least two rigid steps fixed between the inner surfaces of the side members in spaced parallel relation to each other, and fender elements fixed to the outer surface of each side member, each fender element having a cross-section which is generally rounded and bigger in dimension than the side members extending continuously from adjacent the upper extremity to adjacent the lower extremity.

5,487,350
EXPENDABLE UNDERWATER VEHICLE

Raymond A. Chace, Jr., East Freetown, Mass., and Mark C. Manning, Portsmouth, R.I., assignors to Sippican, Inc., Marion, Mass.

Division of Ser. No. 408,060, Mar. 21, 1995. This application Jun. 6, 1995, Ser. No. 469,437
Int. Cl.[6] B63G 8/14
U.S. Cl. 114—330 2 Claims



1. An expendable underwater vehicle for use in training naval forces in anti-submarine warfare in ocean water, comprising:

a body having a length along a longitudinal axis of about three to five feet and a diameter of about five inches, the body comprising

a shroud at a rear end of the body which includes a propeller, elevators, rudders, and static hydrodynamic fins;

actuators for controlling the elevators and the rudders;

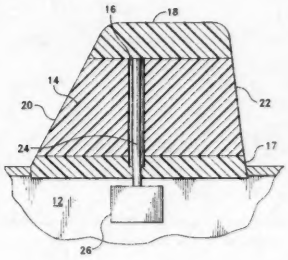
a shaft coupled at one end to the propeller;
an internal motor, coupled to the other end of the shaft, for applying a torque to the propeller via the shaft;
an internal guidance and control subsystem for implementing a predetermined path and speed profile for the vehicle in the ocean water by controlling the motor and the actuators to cause the vehicle to conform to the path and speed profile, the guidance and control subsystem controlling the motor to increase or decrease the torque applied to the propeller to increase or decrease the speed of the vehicle in the ocean water from a first speed to a second speed thereby creating a moment which tends to cause the vehicle to roll about the longitudinal axis as a function of speed, the static hydrodynamic fins counterbalancing the increased or decreased torque as a function of speed to substantially prevent any roll of the vehicle;
an internal signal processing subsystem for simulating a submarine by generating signals representative of the submarine and causing corresponding acoustic signals to be transmitted into the ocean water; and
an internal power source for powering the signal processing subsystem, the guidance and control subsystem, the motor, and the actuators.

5,487,351

CONTROL SURFACE FOR UNDERWATER VEHICLE

William H. Nedderman, Jr, Middletown, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 13, 1995, Ser. No. 372,080
Int. Cl.[6] B63G *8/18*
U.S. Cl. 114—332 **10 Claims**



1. A control surface system for a vehicle comprising:
a flexible elastomeric body having a distal end, a base end;
a channel therethrough extending from said base end to said distal end, said base end being joined to said vehicle;
a rigid tip bar joined to said distal end of said elastomeric body; and
a shaft having a base end and a distal end, said shaft extending from the interior of said vehicle at said body base end through said channel in said body to said body distal end, said shaft distal end being joined to said rigid tip bar to allow said shaft to rotate said tip bar.

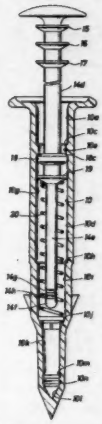
5,487,352

TEMPERATURE INDICATOR FOR COOKED MEATS

John R. Williams, 3301 Providence, Apt. 608, Bryan, Tex. 77803, and Melvin T. Jacobs, Fort Smith, Ark., assignors to John R. Williams, Bryan, Tex.

Filed Sep. 21, 1994, Ser. No. 309,941
Int. Cl.[6] G01K *1/02; 11/00*
U.S. Cl. 116—218 **7 Claims**

1. A temperature indicator for indicating the attainment of a particular temperature in an object in which the temperature indicator is inserted, comprising:



a barrel which is generally cylindrical in configuration having a first open end and a second closed end, said barrel having a bore therein which is open at said first open end of said barrel;
said bore of said barrel extending substantially the length of said barrel and terminating in a closed end at said second closed end of said barrel;
a movable stem which is generally cylindrical in configuration, said stem being mounted in said barrel bore for movement between a contracted position and an extended position;
resilient means mounted in engagement with said barrel bore and said stem for urging said stem to said extended position;
said movable stem having a first end located at said first open end of said barrel bore and a second end located at said closed end of said bore with said stem in said contracted position, said first end of said stem protruding from said barrel with said stem in said extended position, said second end of said stem and said closed end of said barrel bore having space therebetween which is filled with a fusible material which is solidified below a certain particular temperature and becomes softened or melted at said particular temperature;
said resilient means moving said stem to said extended position when said fusible material becomes softened or melted;
said first end of said movable stem having at least one annular seal which extends into sealing engagement with said first open end of said barrel bore with said stem in said contracted position; and
said stem having a multipurpose annular seal longitudinally spaced from said at least one annular seal sufficient distance to seal against said barrel bore when said stem is in the contracted position and when said stem is in the extended position.

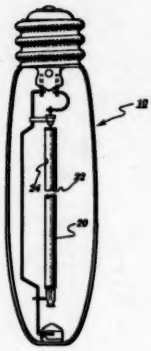
5,487,353

CONVERSION OF DOPED POLYCRYSTALLINE MATERIAL TO SINGLE CRYSTAL

Curtis E. Scott, Mentor; Mary Sue Kaliszewski, Cleveland Heights, both of Ohio, and Lionel M. Levinson, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 14, 1994, Ser. No. 195,187
Int. Cl.[6] C30B *21/04*
U.S. Cl. 117—4 **20 Claims**

1. A solid state process for converting a ceramic polycrystalline alumina body to a sapphire body comprising the steps of:
doping at least a portion of the ceramic material comprising said polycrystalline alumina body with a conversion-enhancing dopant to a selected concentration; and
heating at least the portion of alumina body doped to said selected concentration to a selected temperature for a selected



time so as to convert the portion of the polycrystalline alumina body doped to the selected concentration to a sapphire body, said selected temperature being above one-half of the melting temperature of the doped alumina material but below the melting temperature of the doped alumina material.

5,487,354

METHOD FOR PULLING A SILICON SINGLE CRYSTAL

Wilfried von Ammon; Erich Dornberger, both of Burghausen; Hans Oelkrug, Haiming; Peter Gerlach, Burghausen, and Franz Segieth, Kirchham, all of, Germany, assignors to Wacker-Chemitronic Gesellschaft fuer Eletronik-Grundstoffe mbH, Burghausen, Germany

Filed Dec. 5, 1994, Ser. No. 349,397

Claims priority, application Germany, Dec. 16, 1993, 43 43 051.1; Apr. 28, 1994, 44 14 947.6

Int. Cl.[6] C30B *15/10*

U.S. Cl. 117—13 **6 Claims**

1. A method for pulling a single crystal in the vertical direction with respect to a silicon melt held in a crucible, which method comprises

pulling the single crystal having a solid/liquid phase boundary at a speed which is not higher than a maximum pulling speed (v_{crit}) which is calculated according to the empirical formula

$$v_{crit}=f*G$$

where f is a proportionality factor having the value $13*10^{-4}$ $cm^2/K*min$ and

G is an axial temperature gradient in the region of the solid/liquid phase boundary of the growing single crystal in the unit [K/cm] and the maximum pulling speed v_{crit} is obtained in the unit [cm/min].

5,487,355

SEMICONDUCTOR CRYSTAL GROWTH METHOD

Herng-Der Chiou, Tempe, and Tien-Yu T. Lee, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 3, 1995, Ser. No. 398,258

Int. Cl.[6] C30B *15/20*

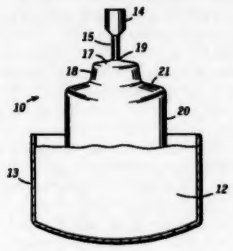
U.S. Cl. 117—13 **13 Claims**

1. A semiconductor crystal growth method comprising the steps of:

providing a melt of a semiconductor material;

inserting a single crystal seed of the semiconductor material into the melt of the semiconductor material;

forming a single crystal ingot of the semiconductor material having a first neck, a second neck, and an elongated body, the second neck having a diameter larger than the first neck and less than the elongated body.



5,487,356

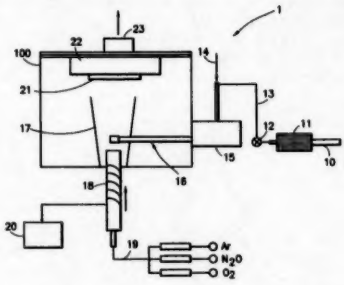
CHEMICAL VAPOR DEPOSITION METHOD OF GROWING OXIDE FILMS WITH GIANT MAGNETORESISTANCE

Yi-Oun Li, and Jiming Zhang, both of Danbury, Conn., assignors to Advanced Technology Materials, Inc., Danbury, Conn.

Continuation-in-part of Ser. No. 280,143, Jul. 25, 1994, which is a continuation of Ser. No. 927,134, Aug. 7, 1992, abandoned. This application Nov. 28, 1994, Ser. No. 345,317

Int. Cl.[6] C30B *23/08*

U.S. Cl. 117—99 **10 Claims**



1. A method of forming on a substrate a giant magnetoresistive (GMR) oxide material of the formula $La_xA_{1-x}MnO_3$

wherein:

A is selected from the group consisting of barium, calcium, and strontium; and

x is a number in the range of from 0.2 to 0.4,

said method comprising the steps of:

providing metalorganic compounds B, C and D in solution, as source reagent solution precursor for said GMR oxide material,

wherein:

B is a beta-diketonate or beta-ketoester adduct of lanthanum;

C is a beta-diketonate or beta-ketoester adduct of A; and

D is a beta-diketonate or beta-ketoester adduct of manganese;

wherein:

each of the B, C and D adducting ligands is the same as the others; and

the molar concentration of B in said source reagent solution is from 0.002 to 0.2 moles/liter of solution;

the molar concentration of C in said source reagent solution is from 0.002 to 0.2 moles/liter of solution; and

the molar concentration of D in said source reagent solution is from 0.01 to 0.5 moles/liter of solution;

vaporizing the source reagent solution precursor to form a multicomponent vapor comprising B, C, and D;

directing the multicomponent vapor into a chemical vapor deposition reactor having a substrate disposed therein, for deposition of lanthanum, A, and manganese from the multicomponent vapor onto the substrate;

maintaining a generally constant pressure in the chemical vapor deposition reactor of oxidizing gas therein, wherein the oxidizing gas is selected from the group consisting of oxygen and N_2O; and

maintaining the substrate at a temperature in the range of 600° C. to 700° C. during said deposition of lanthanum, A, and manganese from the multicomponent vapor onto the substrate.

5,487,357

BORON-CONTAINING ORGANIC GROUP-V COMPOUNDS USEFUL FOR GAS PHASE DEPOSITION OF THE GROUP-V ELEMENT ON SUBSTRATES

Ludwig Pohl, Darmstadt; Herbert Schumann, and Christian Marschall, both of Berlin, all of, Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Germany

PCT No. PCT/EP93/01241, § 371 Date Jan. 28, 1994, § 102(e) Date Jan. 28, 1994, PCT Pub. No. WO93/24675, PCT Pub. Date Dec. 9, 1993

PCT Filed May 19, 1993, Ser. No. 190,028

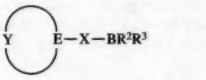
Claims priority, application Germany, May 29, 1992, 42 17 735.9

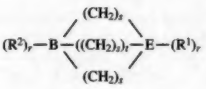
Int. Cl.[6] C23C *16/18;16/38*

U.S. Cl. 117—104 **9 Claims**

1. A method which comprises subjecting a boron-containing, Group VA element-containing organic compound to gas-phase deposition conditions in the presence of a substrate to deposit a Group VA element on the substrate wherein the boron-containing, Group VA element-containing organic compound is a compound of one of the following formulae:

$$(R^1)_{3-m}E(X\text{-}BR^2R^3)_m$$



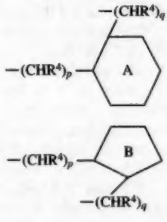


wherein

E is nitrogen, phosphorus, arsenic or antimony,

m is 1, 2 or 3,

X is $—(CHR^4)_n—$



A is a phenyl, cyclohexyl, cyclohexenyl or cyclohexadienyl ring,

B is a cyclopentyl, cyclopentenyl or cyclopentadienyl ring,

n is 1, 2, 3, 4, 5 or 6,

p and q are each, independently of one another, 0, 1, 2, 3, or 4,

Y is an alkylene or alkylidene group having 3–7 C atoms, in which one or more H atoms may be replaced by R^5, and, optionally, one or more non-adjacent double bonds are present in the alkylidene group,

s in each case is 1, 2, 3 or 4,

r and t are each 0 or 1, while

r+t is 1,

R^1, R^2 and R^3 are each, independently of one another, H, an alkyl group having 1 to 8 C atoms, which group may be partially or completely fluorinated, a cycloalkyl or cycloalkenyl group having 3–8 C atoms or an aryl group and

R^4 in each case is H or an alkyl group having 1–4 C atoms which may also be partially or completely fluorinated.

5,487,358

APPARATUS FOR GROWING SILICON EPITAXIAL LAYER

Yutaka Ohta, and Takatoshi Nagoya, both of Annaka, Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

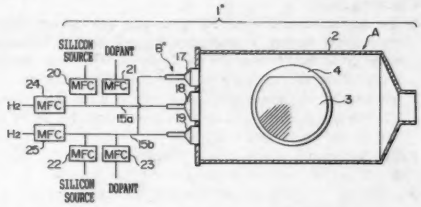
Division of Ser. No. 163,708, Dec. 9, 1993, Pat. No. 5,421,288.

This application Mar. 23, 1995, Ser. No. 408,980

Claims priority, application Japan, Dec. 9, 1992, 4-352940; Jul. 8, 1993, 5-193194

Int. Cl.[6] C30B *35/00*

U.S. Cl. 117—200 **4 Claims**



1. An apparatus for growing a silicon epitaxial layer on a main surface of a silicon substrate wafer, comprising:

a horizontal chamber;

a susceptor mounted within the chamber, the top surface of the susceptor holding the silicon substrate wafer in a horizontal position so that said main surface of the silicon substrate wafer is facing upward;

means for rotating said susceptor;

an exhaust gas outlet;

a series of injectors arranged; transversely to the horizontal axis of the chamber, the injectors comprising a central injector passing a flow of a reactive gas past a central part of the chamber and peripheral injectors passing flows of the reactive gas past a peripheral part of the chamber, the reactive gas consisting of a silicon source, a dopant and hydrogen;

a first gas feeder system connected to the central injector and feeding the reactive gas to the central injector;

a second gas feeder system connected to the peripheral injectors and feeding the reactive gas to said peripheral injectors;

a first controller provided in the first gas feeder system and controlling the mass flows of at least one of the silicon source and the dopant fed by the central injector; and

a second controller provided in the second gas feeder system and controlling the mass flows of at least one of the silicon source and the dopant fed by the peripheral injectors independently of the first controller. injector independently of the first controller.

5,487,359

LOW AMPERAGE ELECTRONIC MILK LEVEL DETECTOR

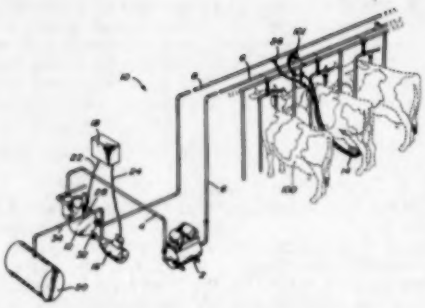
Michel Montreuil, 13, rue Marie-Claude, St-Charles-de-Bellechasse, Québec, Canada

Filed Mar. 9, 1994, Ser. No. 207,708

Int. Cl.[6] A01J *5/00*

U.S. Cl. 119—14.17 **8 Claims**

1. An electric device for detecting the level of milk in a receptacle in view of controlling said level of the milk, said receptacle being installed in a milking system for accumulating milk drawn



through piping of the milking system from at least one animal being milked, and said receptacle comprising at least two electrodes mounted therein to contact milk when a predetermined level of milk is reached in the receptacle, said milk level detecting device comprising:

an alternating current source for generating a detecting alternating current having a frequency situated with a frequency range comprised between 0.5 kHz and 1 MHz, said alternating current source being connected to the two electrodes whereby the detecting alternating current flows through said alternating current source and the two electrodes when said two electrodes contact milk; and

means for sensing the detecting alternating current to thereby detect reaching of said predetermined level of milk;

wherein the frequency of the detecting alternating current, situated within the frequency range comprised between 0.5 kHz and 1 MHz, reduce the sensitivity of the animal being milked to any stray current originating from said alternating current source and reaching the animal being milked.

5,487,360

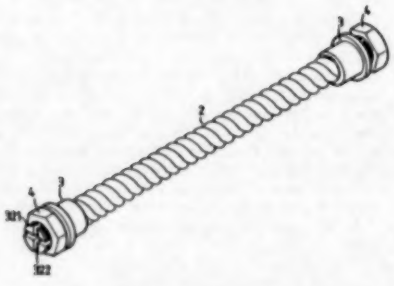
PERCHING ROD FOR BIRD CAGE

Yeong J. Yau, P.O. Box 1750, Taichung, Taiwan, Prov. of China

Filed Jun. 27, 1994, Ser. No. 266,475

Int. Cl.[6] A01K *31/12*

U.S. Cl. 119—26 **1 Claim**



1. A perching rod for a bird cage comprising:

a perching rod body for disposing in said bird cage, said perching rod including two ends;

two retaining members each including a first end fastened to said ends of said perching rod and including a second end having an outer thread formed thereon, said second ends of said retaining members each including a cruciform slot formed therein and having a predetermined depth for retaining therein an upright rod, a horizontal rod or a junction of said upright rod and said horizontal rod of said bird cage, said cruciform slots of said retaining members each including a bottom surface having an anti-skidding surface formed thereon for preventing sliding movement of said upright rod and said horizontal rod in said cruciform slots; and

two fastening nuts having an inner thread formed therein for engaging with said outer thread of said retaining member and for securing said perching rod body to said upright rod and said horizontal rod.

5,487,361

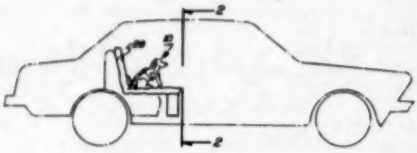
SUPPLEMENTAL AUTOMOBILE SEAT FOR USE BY DOGS

Deanna Dean, 312 Woodward Rd., Media, Pa. 19065

Filed Nov. 23, 1994, Ser. No. 344,012

Int. Cl.[6] A01J *1/00*

U.S. Cl. 119—28.5 **1 Claim**



1. A new and improved supplemental automobile seat for use by dogs traveling in an automobile comprising, in combination:

a horizontal seat component having parallel side edges, a rear edge positionable at a location adjacent to a rear edge of a rear car seat of the automobile, and a parallel forward edge positionable forwardly of a forward edge of the rear car seat, the horizontal seat component formed of a rigid component covered with a foam material, the horizontal seat component further having a width that is essentially equal to a width of the rear car seat upon which it is positioned;

a vertical seat component having parallel side edges, an upper edge positionable at a location adjacent to an upper edge of the rear car seat, and a parallel lower edge positionable at a location adjacent to the rear edge of the horizontal seat component, the vertical seat component formed of a foam material, the vertical seat component having a width that is essentially equal to the width of the rear car seat upon which it is positioned;

a cover secured over the horizontal seat component and the vertical seat component and with the cover having a living hinge integrally formed therealong at a region between the rear edge of the horizontal seat component and the lower edge of the vertical seat component to allow the seat components to be folded against each other to facilitate their storage, the cover further having a side edge with a slot formed therealong and with the seat components removable from the cover through the slot, the cover additionally including pile-type fasteners attached to areas of overlap adjacent to the slot and with the fasteners securable to prevent access to the seat components, the cover also including a pair of spaced slots formed through the living hinge and with each slot sized to receive a half of a seat belt of the rear car seat therethrough;

a pair of removable vertical legs positioned in contact with and extended downwardly from the horizontal seat component at a location adjacent to the forward edge thereof, the legs having lower ends positionable on a floor of the automobile at a location forwardly of the rear car seat; and

a slide loop of an essentially inextensive material securable round the seat belt when the halves thereof are coupled together and with the slide loop having a size that allows it to move along a longitudinal extent of the coupled seat belt, the slide loop further having a swivel component secured thereto and with the swivel component securable with an end of a dog leash.

5,487,362

COMBUSTION ENGINE OF THE PISTON ENGINE TYPE

Jens E. Wellev, Virum; Flemming Voergaard, Helsingør, and Holger S. Andersen, Skibby, all of, Denmark, assignors to Alex Jensen A/S, Skibby, Skibby, Denmark

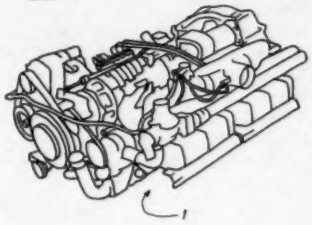
PCT No. PCT/DK91/00079, § 371 Date Sep. 15, 1992, § 102(e) Date Sep. 15, 1992, PCT Pub. No. WO91/14086, PCT Pub. Date Sep. 19, 1991

PCT Filed Mar. 15, 1991, Ser. No. 924,072

Claims priority, application Denmark, Mar. 16, 1990, 693/90

Int. Cl.[6] F02M *21/02*

U.S. Cl. 123—27 GE 9 Claims



1. A combustion engine of the piston engine type for running on a mixture of combustible gas and air comprising:

at least one combustion chamber comprising a piston and having a static compression ratio in the range of 15:1 to 20:1;

apparatus for producing a charge of the mixture of combustible gas and air in the combustion chamber; and

a spark generating device in the combustion chamber for igniting the mixture of combustible gas and air at an ignition point situated in the range of 0° to 20° after top dead center of the piston in the combustion chamber.

5,487,363

INTERNAL-COMBUSTION ENGINE COMPRISING TWO CYLINDER BANKS

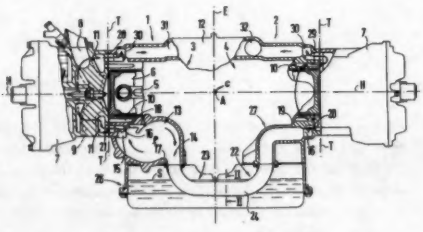
Manfred Batzill, Neuhausen; Hans-Joachim Esch, Heimsheim; Hans Mezger, Freiberg; Winfried Distelrath, Stuttgart, and Albrecht Reustle, Walheim, all of, Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Weissach, Germany

Filed Jul. 5, 1994, Ser. No. 266,860

Claims priority, application Germany, Jul. 2, 1993, 43 22 030.4

Int. Cl.[6] F02B *75/18*

U.S. Cl. 123—41.74 8 Claims



1. An internal-combustion engine comprising:

an engine crankshaft having a crankshaft axis;

first and second cylinder banks with cylinder blocks for cylinders housing pistons drivingly connected to the crankshaft, said first and second cylinder banks being disposed at opposite lateral sides of the crankshaft axis;

a first cylinder head connected to the first cylinder block along a first separating plane;

a second cylinder head connected to the second cylinder block along a second separating plane;

a cooling water pump arranged on an end face of the first cylinder block;

a connecting duct extending between the pump and the second cylinder bank, said connecting duct extending underneath the crankshaft axis;

cooling water jackets in the cylinder blocks, and a cooling opening in the cylinder heads through which cooling water from the pump flows in a transverse manner;

a cooling water collector arranged above the crankshaft axis for collecting water flowing from the cylinder banks;

a feeding duct for cooling water arranged in each respective lower wall of the first and second cylinder banks adjacent the respective first and second separating planes and extending below and parallel to the crankshaft axis, said feeding ducts extending from respective lower walls of the cylinder banks through the associated separating plane into the associated cylinder head and then communicating with said cooling water jackets; and

a discharge duct for cooling water arranged in each respective upper wall of the first and second cylinder banks adjacent the respective first and second separating planes and extending parallel to the crankshaft axis.

5,487,364

PISTON FOR AN INTERNAL COMBUSTION ENGINE

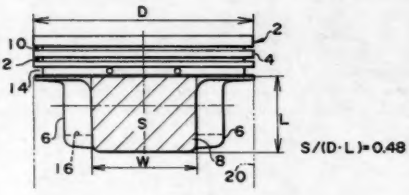
Masashi Takeda; Kazuyuki Fukuhara, both of Toyota, and Motoichi Murakami, Susono, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 23, 1994, Ser. No. 216,981

Claims priority, application Japan, Jun. 10, 1993, 5-138244

Int. Cl.[6] F02F *3/00*

U.S. Cl. 123—193.6 10 Claims



1. A piston for an internal combustion engine comprising:

a top portion;

a pair of boss portions opposed to each other in a first diametrical direction of the piston, each of the boss portions being integrally connected to the top portion from a lower side of the top portion and having a piston-pin hole formed therein; and

a pair of skirt portions opposed to each other in a second diametrical direction of the piston perpendicular to the first diametrical direction of the piston, each of the skirt portions being integrally connected to the top portion from the lower side of the top portion, wherein each skirt portion is configured so as to satisfy the following dimensional relationship:

$$.4 \leqq S/(D \cdot L) \leqq .55$$

where, L is a length of said each skirt portion, D is a diameter of a cylinder bore into which said piston is inserted, and S is an area of an image which each skirt portion forms when projected onto a vertical plane parallel to the first diametrical direction of the piston and wherein each skirt portion has an upper portion and a lower portion, and wherein the lower portion has a greater width than the upper portion.

5,487,365

INDUCTION SYSTEM FOR ENGINE

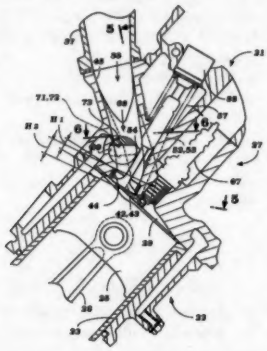
Yoshiharu Isaka, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Continuation-in-part of Ser. No. 834,604, Feb. 12, 1992, Pat. No. 5,359,972. This application Jan. 14, 1994, Ser. No. 182,274

Claims priority, application Japan, Feb. 21, 1991, 3-047436; Apr. 8, 1991, 3-101789; Apr. 15, 1991, 3-111182; Jun. 28, 1991, 3-185400; Aug. 5, 1991, 3-218015; Aug. 30, 1991, 3-247018; Jan. 14, 1993, 5-005199

Int. Cl.[6] **F02B** *31/00*

U.S. Cl. 123—306 **33 Claims**



1. An induction system for an internal combustion engine having a cylinder bore defining in part a combustion chamber, induction passage means for delivering a charge to said combustion chamber, said induction passage means providing a generally axially unrestricted flow of the charge into said combustion chamber of said cylinder bore, and control valve means in said induction passage means and movable between a first position wherein the flow of the charge into the combustion chamber is generally unrestricted and in a generally axial direction and a second position to redirect the flow into the combustion chamber in a direction to generate a slant tumble flow with the charge flowing in a tumble motion around an axis transverse to the axis of the cylinder bore and at an angle to a plane containing the cylinder bore and tumble axis.

5,487,366

INTAKE MANIFOLD

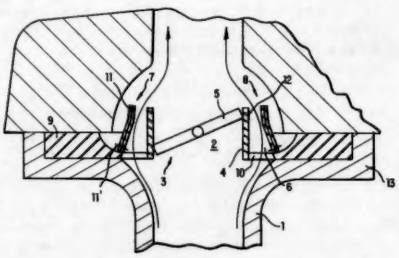
Klaus Döhring, München, Germany, assignor to Firma Carl Freudenberg, Weinheim, Germany

Filed Apr. 8, 1994, Ser. No. 225,198

Claims priority, application Germany, Apr. 8, 1993, 43 11 744.9

Int. Cl.[6] **F02B** *27/02;* **F02M** *35/10*

U.S. Cl. 123—336 **18 Claims**



1. An intake manifold for use with a combustion engine, comprising:

a dimensionally stable induction pipe body having at least one first flow-through opening, the flow through opening defining a passage and further having a boundary wall;

at least one first adjusting element arranged in the first flow-through opening to vary the cross-sectional area of the passage of the first flow-through opening, the adjusting element comprising a throttle valve that is rotatably supported in the induction pipe body and which is capable of being urged to sealingly contact the boundary wall of the first flow-through opening;

at least one second flow-through opening in the area immediately laterally adjacent the throttle valve within the induction pipe body, the second flow-through openings serving as a by-pass so as to be immediately laterally adjacent to the first flow-through opening in the area of the throttle valve; and

at least one adjusting element assigned to the second flow-through opening for sealing same, said adjusting element comprising a one-way valve that can be forced into an open position only by a fluid flow directed towards the associated combustion engine.

5,487,367

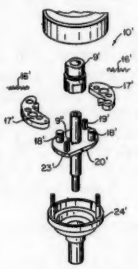
MOTORCYCLE CIRCUIT BREAKER IGNITION ADVANCE

Keith R. Lassiter, P.O. Box 432, Kearneysville, W. Va. 25430

Filed Apr. 3, 1995, Ser. No. 415,252

Int. Cl.[6] **F02D** *5/00*

U.S. Cl. 123—420 **6 Claims**



1. In combination with circuit breaker ignition apparatus of motorcycle engines, an ignition advance unit, comprising:

a) an advance unit assembly base plate **23'** and centrally disposed breaker cam journal **24"** thereon, said backing plate journal having connection to a driving gear cam **24'**; opposed flyweight mounting pins **19'** projecting from the backing plate **23'** and opposed flyweight mounting pins **19'** on the plate **23'**; opposed flyweight roll pins **18'** thereon; breaker cam spot pin **6'** interposed on the plate **23'** between the breaker cam **9'** and flyweight roll pins **18'**;

b) a breaker cam **9'** mounted in extension of journal **24"**, centrally thereof;

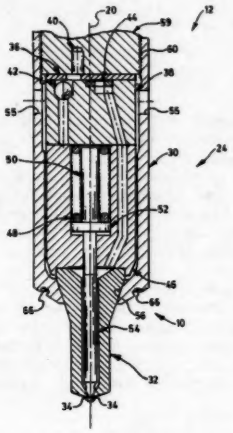
c) centrifugally activated flyweights **17'** slideably contacting contiguous portions of the baseplate **23**, the flyweights being pivoted upon respective mounting pins **19'** at opposed proximal breaker cam ends thereof, with tension springs **16'** interconnecting distal ends of the flyweights **17'** to the mounting pins **19'**, said flyweights having roll pins **18'** which are press fit into the baseplate **23'**.

5,487,368

COMBUSTION GAS SEAL ASSEMBLY ADAPTED FOR A FUEL INJECTOR

E. Eugene Bruning, Normal, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Jul. 29, 1994, Ser. No. 282,942
Int. Cl.[6] F02M *55/02*
U.S. Cl. 123—470 **16 Claims**



1. A combustion gas seal assembly adapted for a fuel injector installed in an engine, said combustion gas seal assembly comprising:

an engine member;

a fuel injector, said fuel injector including a nozzle case and a nozzle tip portion, said nozzle case including an axial aperture through which said nozzle tip extends; and

a flexible annular seal positioned between the nozzle case and the engine member, said nozzle case and engine member each defining opposed annular seat portions in contact with one another, at least one of the seat portions of the nozzle case and the engine member defining an annular groove, said flexible annular seal positioned in the annular groove and sealedly compressed by the opposed annular seat portions.

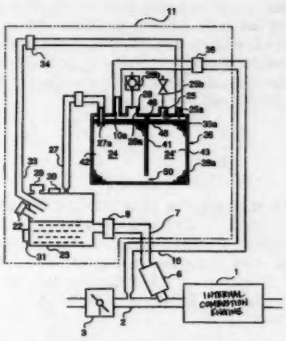
5,487,369

EVAPORATIVE EMISSION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Takeshi Hara; Kouichi Hidano; Teruo Wakashiro; Kazumi Yamazaki, all of Wako, and Tomoyuki Kawakami, Tochigi, all of, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1994, Ser. No. 338,218
Claims priority, application Japan, Nov. 9, 1993, 5-304667
Int. Cl.[6] F02M *33/02*
U.S. Cl. 123—520 **7 Claims**

1. In an evaporative emission control system for an internal combustion engine having an intake passage, and a fuel tank, including a canister for adsorbing evaporative fuel generated in said fuel tank, partition means partitioning an interior of said canister at least into a first adsorbent chamber and a second adsorbent chamber, a communication passage connecting between said first and second adsorbent chambers, a first introducing passage connected to said first adsorbent chamber, for introducing said evaporative fuel generated in said fuel tank into said first adsorbent chamber on an occasion other than at refueling, a purging passage connected to said first adsorbent chamber, for purging said evaporative fuel adsorbed in said canister into said intake passage of said



engine, and an air-inlet passage connected to said second adsorbent chamber and communicating with the atmosphere, the improvement comprising:

a second introducing passage connected to said second adsorbent chamber, for introducing said evaporative fuel generated in said fuel tank at refueling into said second adsorbent chamber;

an additional passage connected to said first adsorbent chamber and communicating with the atmosphere, said additional passage having a cross sectional area larger than a cross sectional area of said air-inlet passage;

first valve means arranged across said air-inlet passage, for closing said air-inlet passage at refueling; and

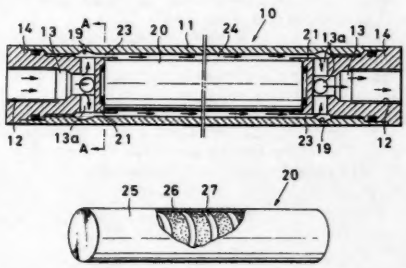
second valve means arranged across said additional passage, for opening said additional passage at refueling.

5,487,370

FUEL OIL IMPROVEMENT APPARATUS

Minoru Miyazaki, Tosu, Japan, assignor to Atsushi Maki, Tokyo, Japan

Filed Jan. 25, 1995, Ser. No. 377,956
Claims priority, application Japan, Feb. 2, 1994, 6-030916
Int. Cl.[6] B01D *35/06*
U.S. Cl. 123—538 **3 Claims**



1. An improvement apparatus of fuel oil to be fed, comprising a multiplicity of annular or disk-like permanent magnets having one surface of N pole and the other surface of S pole and arranged in close contact with each other in mutually repulsive relation to be enclosed into a sealed case to form a repulsive magnetic field producing body adapted to produce repulsive magnetic fields produced by said permanent magnets disposed in the mutually repulsive relation in outer peripheral portions of said case, a cylindrical casing in which said repulsive magnetic field producing body is held loosely and having an inlet of fuel oil formed in one end and an outlet of fuel oil formed in the other end, and annular loose space formed between said repulsive magnetic field producing

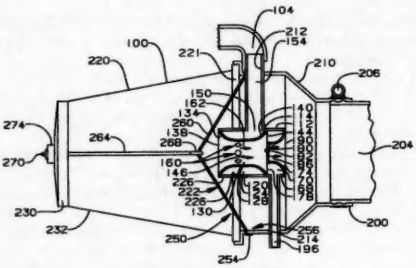
body and said cylindrical casing to constitute an outer peripheral oil passage of fuel oil which communicates with an inlet and an outlet of fuel oil, whereby the repulsive magnetic fields produced by said repulsive magnetic field producing body are exerted on fuel oil passing through said outer peripheral oil passage to convert oil particles of fuel oil into minute particles.

5,487,371

AIR-OIL SEPARATOR UTILIZING CENTRIFUGAL SEPARATION

Kurt D. Beckman, Chillicothe, and Beth A. Hinchee, Murphysboro, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 27, 1994, Ser. No. 363,782
Int. Cl.[6] F02B *47/08*; F02M *25/06*
U.S. Cl. 123—572 **12 Claims**



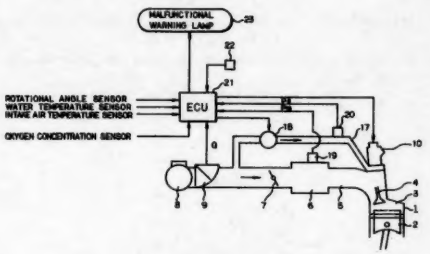
1. An air-oil separator, comprising:
a housing having an outer wall;
a first compartment located within the housing, the first compartment having an outer annular chamber, an inner chamber in communication with the outer chamber, an apertured central annular wall separating the outer chamber from the inner chamber with the central wall having a first end portion diverging toward the outer wall to define a first fluid inlet port adapted to admit fresh air into the inner chamber, and second fluid inlet port extending from the outer chamber through the outer wall of the housing adapted to admit blow-by gas into the outer chamber so that blow-by gas is allowed to flow through the apertured central wall an into the inner chamber for introduction to the fresh air;
the central wall having a second end portion opposite the first end portion and diverging toward the outer wall to define a fluid outlet port adapted to allow the fresh air and blow-by gas to exit the first compartment; and
a second compartment located within the housing adjacent the first compartment, the second compartment adapted to separate oil from the blow-by gas within the fresh air as the blow-by gas and fresh air pass therethrough.

5,487,372

MALFUNCTIONAL DETECTING APPARATUS FOR AN ASSIST AIR CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Hisashi Iida, Ama, and Keiji Honjoh, Anjo, both of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 7, 1994, Ser. No. 255,767
Claims priority, application Japan, Jun. 8, 1993, 5-137932
Int. Cl.[6] F02B *23/00*
U.S. Cl. 123—585 **11 Claims**



1. A malfunctional detecting apparatus for an assist air control system for internal combustion engines comprising:
a fuel injection valve for injecting fuel from an injection port thereof into an intake passage at downstream side of a throttle valve;
assist air passage means for defining an assist air passage having an opening toward said injection port of said fuel injection valve through which assist air passes;
an air control valve disposed in said assist air passage for being operated to open and close said assist air passage;
control means for controlling quantity of air to be introduced into said opening of said assist air passage by opening and closing said air control valve in synchronism with said fuel injection valve;
an assist air passage pressure sensor disposed in said assist air passage at downstream side of said air control valve for detecting air pressure in said assist air passage; and
malfunctional judging means for said air control valve based on air pressure detected by said assist air passage pressure sensor immediate after said air control valve is operated.

5,487,373

ARCHERY BOW WITH LATERALLY ADJUSTABLE LIMB POCKET

Allan F. Smith, Tucson, Ariz., assignor to Precision Shooting Equipment, Inc., Tucson, Ariz.

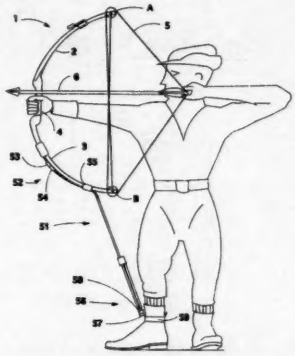
Filed Aug. 24, 1994, Ser. No. 294,927
Int. Cl.[6] F41B *5/00*
U.S. Cl. 124—23.1 **9 Claims**

1. An archery bow comprising:
a handle having two ends;
a pair of limbs each having a butt end for attachment to said handle and a free end;
a bowstring interconnecting the free ends of said limbs;
a pair of limb pockets interconnecting the ends of the handle and the butt ends of said limbs;
a pair of limb bolts for attaching said limbs and said pockets to said handle;
wherein each limb pocket has an elongated feature extending across said pocket, said feature permitting at least a portion of said pocket to move from side to side on said handle whereby each limb can be positioned laterally on said handle.

5,487,374
BOW STABILIZER

Michael Herminath, 806 N. Water, New London, and Richard Wolfrath, Hwy. 45 S., both of New London, Wis. 54961

Filed Jul. 1, 1994, Ser. No. 269,776
Int. Cl.[6] F41B *5/14*
U.S. Cl. 124—86 **24 Claims**



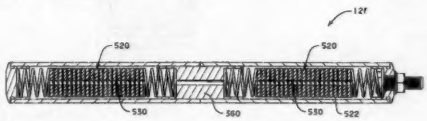
1. A bow stabilizer and positioner comprising;
a) a tether having a length, a bow end, and a foot end,
b) said tether having said bow end provided with a means for connecting said tether to a lower limb of a bow,
c) said tether having said foot end provided with a means for connecting said foot end to a foot of a bowman, and
d) the length of said tether is such that said tether can be drawn taut by a bowman raising said bow to a firing position.

20. A method for stabilizing and positioning a bow having at least, a grip, an upper limb, a lower limb, and comprising the steps of,
1) attaching a first end of a tether to the lower limb of the bow,
2) attaching a second end of said tether to the foot of a bowman,
3) engaging the grip by a hand of the bowman,
4) raising the bow until a tension is established in the tether, thereby bringing the bow into a vertical plane,
5) maintaining the tension in the tether while drawing the bow and releasing an arrow, thereby providing a steady-rest for stabilizing the vertical plane of the bow during the drawing of the bow and the releasing of the arrow.

5,487,375
STABILIZERS ADAPTED TO BE CONNECTED TO A BOW

Norman J. McDonald, Jr., Rte. 1, Box 155, Hendrix, Okla. 74741

Division of Ser. No. 127,846, Sep. 28, 1993. This application May 9, 1994, Ser. No. 239,490
Int. Cl.[6] F41B *5/20*
U.S. Cl. 124—89 **4 Claims**

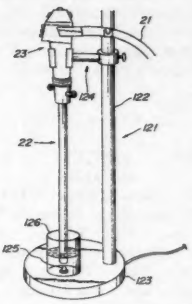


1. A stabilizer for use with a bow comprising:
a stabilizer tube having a first end and a second end, a stabilizer opening being formed through the stabilizer tube forming a stabilizer chamber, the stabilizer tube comprising:
a first tube segment having a first end forming the first end of the stabilizer tube and a second end, a first chamber being formed in the first tube segment forming a portion of the stabilizer chamber; and
a second tube segment having a first end forming the second end of the stabilizer tube and a second end, a second chamber being formed in the second tube segment forming a portion of the stabilizer chamber;
a divider ring, the second end of the first tube segment being connected to the divider ring and the second end of the second tube segment being connected to the divider ring, the divider ring having an opening formed therethrough providing fluidic communication between the first chamber and the second chamber;
a first piston disposed in the first chamber;
spring means disposed in the first chamber for resiliently positioning the first piston between the first end of the first tube segment and the divider ring;
a second piston disposed in the second chamber; and
spring means disposed in the second chamber for resiliently positioning the second piston between the second end of the second tube segment and the divider ring.

5,487,376
WASHING APPARATUS FOR A PROTECTION COVER FOR AN ENDOSCOPE

Hisao Yabe; Yoshihiro Iida; Akira Suzuki; Hideo Ito; Yoshio Tashiro; Minoru Yamazaki, and Osamu Tamada, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1993, Ser. No. 37,405
Claims priority, application Japan, Feb. 25, 1993, 5-007138 U; Mar. 1, 1993, 5-040014
Int. Cl.[6] A61B *1/00*
U.S. Cl. 600—121 **3 Claims**

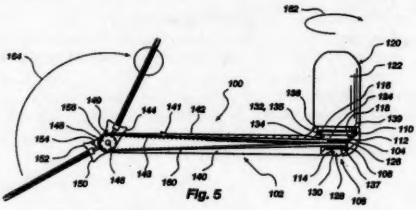


1. An apparatus for washing a protection cover for use in an endoscope system including an endoscope having an insertion section insertable into a cavity under inspection and an operation section to which a proximal end of the insertion section is connected and a protection cover having an insertion section cover for covering said insertion section of the endoscope and an operation section cover for covering said operation section of the endoscope, said insertion section cover having an air supply conduit channel, a water supply conduit channel and a suction channel formed therein, said washing apparatus comprising:
means for supporting said protection cover in such a posture that the distal end of the insertion section cover is directed toward the ground;
means for containing a liquid into which said distal end of the insertion section cover is immersed; and
means for automatically starting a washing operation, said washing operation being performed by supplying air through said air supply conduit channel, thereafter supplying water through said water supply conduit channel and thereafter sucking liquid through said suction channel.

5,487,377
UTERINE MANIPULATOR AND MANIPULATOR TIP ASSEMBLY

Steven R. Smith, Draper; Christopher A. Cutler, Centerville, and William D. Wallace, Salt Lake City, all of Utah, assignors to Clinical Innovation Associates, Inc., Murray, Utah

Filed Nov. 5, 1993, Ser. No. 148,840
Int. Cl.[6] A61B *1/32*
U.S. Cl. 600—204 **20 Claims**



1. A uterine manipulator, comprising:

an elongated insertion rod defining a longitudinal axis and having a proximal end and a distal end;

tip support means pivotally mounted to said distal end of said insertion rod about an axis substantially perpendicular to said insertion rod axis and including means for carrying a manipulator tip assembly thereon;

tip drive means secured to said proximal end of said insertion rod for manual movement by a user of said uterine manipulator;

drive linkage means for transmitting said manual movement of said tip drive means to said tip support means to effect rotation of the latter about said pivot axis over a range of motion of at least about 90° anteverted and at least about 30° retroverted with respect to said insertion rod axis; and

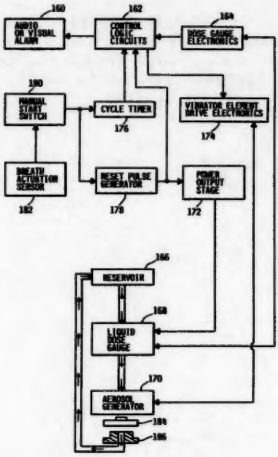
a manipulator tip assembly secured to said tip support, extending therefrom and including a substantially rigid tubular element having an inflatable balloon proximate a free end thereof and lumen means for inflating said balloon.

5,487,378
INHALER

Paul A. Robertson, Chishall; Peter J. Houzego, Oakington, both of, Great Britain; Borge R. Jensen, Brussels, Belgium; Murray A. Creeke, Saffron Walden, Great Britain; Neil Emerton, Riverside, Great Britain; Peter D. Hodson, Trowell, Great Britain, and Eric A. Baum, Loughborough, Great Britain, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

PCT No. PCT/GB91/02250, § 371 Date Oct. 4, 1993, § 102(e) Date Oct. 4, 1993, PCT Pub. No. WO92/11050, PCT Pub. Date Jul. 9, 1992
PCT Filed Dec. 17, 1991, Ser. No. 78,151
Claims priority, application United Kingdom, Dec. 17, 1990, 9027257; Jan. 24, 1991, 9101527
Int. Cl.[6] A61M *11/00*
U.S. Cl. 128—200.16 **24 Claims**

1. An inhaler device for dispensing droplets of liquid medicament to a patient comprising a body having a mouthpiece or nasal adaptor, a reservoir of liquid medicament, and an aerosol generator in communication with said reservoir, the aerosol generator comprising a chamber for liquid medicament and a nozzle arrangement comprising a plurality of orifices in fluid flow relationship with liquid medicament in said chamber, the reservoir having walls which tend to spring to a state of maximum internal volume so as to create a slight negative head of pressure within said reservoir and said chamber, the aerosol generator further comprising means for cyclically pressurising the liquid medicament in said chamber such that liquid from said chamber is periodically expelled through the orifices as atomised droplets of liquid medicament so they may be inhaled via the mouthpiece or nasal adaptor, the inhaler device

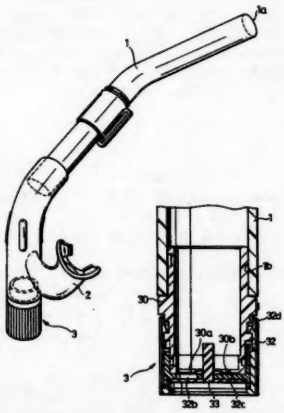


additionally comprising dosage control means for deactivating the aerosol generator after a predetermined time or after a predetermined volume of liquid medicament has been expelled from the chamber.

5,487,379
SNORKEL

Eiichi Koshiishi, Tokyo, Japan, assignor to Harisan Co., Ltd., Tokyo, Japan

Filed Nov. 1, 1994, Ser. No. 332,765
Claims priority, application Japan, Aug. 30, 1994, 6-204910
Int. Cl.[6] A62B *7/00*; B63C *11/00*
U.S. Cl. 128—201.11 **2 Claims**

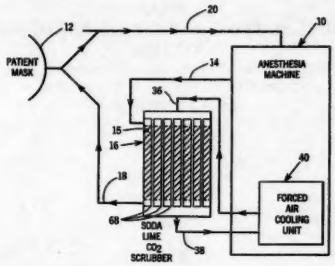


1. A snorkel comprising a tubular body (**1**) having a mouth piece (**2**) close to its lower end and a water-exhaust valve mechanism (**3**) fixed to its water-exhaust bottom opening (**1***b*), said mouth piece communicating with said water-exhaust valve mechanism, characterized in that said water-exhaust valve mechanism (**3**) has a valve body (**30**) attached to the water-exhaust bottom opening (**1***b*) of said tubular body (**1**) in a water-tight fashion, and having a predetermined shape of water-exhaust aperture (**30***a*), and control means movably attached to said valve body (**30**) for nonstep varying of the opening area of the water-exhaust bottom opening of said tubular body.

5,487,380
EXHALED GAS FILTER AND COOLER

Richard W. Grabenkort, Barrington, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

Filed Oct. 19, 1993, Ser. No. 139,233
Int. Cl.[6] A61M *16/00*; A62B *7/10;23/02*; F24F *5/00*
U.S. Cl. 128—204.15 5 Claims



1. An apparatus for removing a selected constituent from a patient's exhaled breath, said apparatus comprising:

an enclosure defining a chamber containing a means for removing a selected constituent from exhaled breathing fluids passing through said chamber, said means for removing comprising a scrubbing substance; a means for admitting exhaled breathing fluids into said chamber comprising a first influent opening; a means for admitting a coolant fluid into said chamber comprising a second influent opening; a means for discharging scrubbed exhaled fluids from said chamber comprising a first effluent opening; a means for discharging used coolant fluid from said chamber comprising a second effluent opening; and a means for cooling said chamber of said enclosure, said means for cooling comprising a plurality of conduits extending through said chamber defined by said enclosure and through said scrubbing substance contained in said chamber, said plurality of conduits receiving and directing a coolant fluid therethrough, each of said plurality of conduits having a first end portion and a second end portion, said first end portion of each of said plurality of conduits being in fluid communication with said second influent opening defined by said enclosure, said second end portion of each of said plurality of conduits being in fluid communication with said second effluent opening defined by said enclosure, said plurality of conduits being arranged closer together in a central region of said chamber than in a peripheral region of said chamber, whereby coolant fluid admitted into said chamber through said second influent opening passes through said plurality of conduits and is discharged through said second effluent opening.

5,487,381
CLOSED SYSTEM FOR TREATING PULMONARY PATIENT

Walter J. Jinotti, 10 Scott St., New Brunswick, N.J. 08903

Filed Apr. 20, 1994, Ser. No. 230,507
Int. Cl.[6] A61M *16/20*
U.S. Cl. 128—207.14 10 Claims

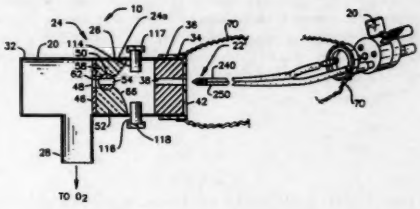
1. Medical apparatus comprising a closed system for providing oxygen and suction to a patient including

a tubular member having a front patient portion and a rear portion, said rear portion having a front end and a rear end,

a first wall disposed between said front patient portion and said front end of said rear portion, said first wall having a front surface and a rear surface,

a hole in said first wall,

a second wall at said rear end of said rear portion closing off said rear portion of said tubular member, said second wall having means for permitting a catheter to enter and leave said tubular member,



an auxiliary tubular member coupled to said front patient portion for providing treatment means to a patient,

a valve member comprising a rod having a through-hole rotatably mounted in said rear portion of said tubular member closely adjacent to said rear surface of said first wall and in fluid tight engagement therewith,

a through-hole in said valve member, said through-hole being aligned with said hole in said first wall in one position of said valve member to permit a catheter to pass through and said through-hole being out of alignment with said hole in said first wall in another position of said valve member, said valve member providing a leakproof block of said hole in said wall when said valve member is in said another position,

means coupled to said second wall of said rear portion of said tubular member for inserting a catheter therein and into said tubular member and for removing a catheter after it has been withdrawn from a patient through said front portion of said tubular member, and

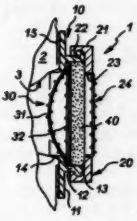
means coupled to said rear portion of said tubular member for admitting a washing fluid into said rear portion and for washing a catheter after it has been withdrawn from a patient,

said first wall and said valve member and said second wall forming a relatively fluid tight washing chamber for said tubular member.

5,487,382
TRACHEOTOMY FILTER FOR TRACHEOTOMY PATIENTS

Robert Bezicot, 48 rue Joseph Fouriaux, 92160 Antony, France

PCT No. PCT/FR92/00999, § 371 Date Apr. 28, 1994, § 102(e) Date Apr. 28, 1994, PCT Pub. No. WO93/08860, PCT Pub. Date May 13, 1993
PCT Filed Oct. 26, 1992, Ser. No. 232,123
Claims priority, application France, Jan. 30, 1991, 91 13378
Int. Cl.[6] A61M *16/00*
U.S. Cl. 128—207.14 22 Claims



1. Tracheotomy filter for a tracheotomy patient having a surgical opening joining the trachea to the skin, said tracheotomy filter comprising an apertured casing having an annular flange for attaching the casing to a peripheral skin zone surrounding the surgical opening, the apertured casing housing a hydrophilic filter mass forming an exchanger for alternate exchange of heat and moisture between exhaled air and inhaled air and a grill disposed to one side of the filter mass facing the surgical opening, the grill comprising anterior and posterior grill components respectively facing the filter mass and the surgical opening, a space being

defined between operative central portions of said anterior and posterior components, said posterior component having openings defined for blocking penetration of mucus and said filter mass being sufficiently spaced from said posterior component whereby most mucus expelled from the trachea is prevented from reaching the filter mass.

5,487,383

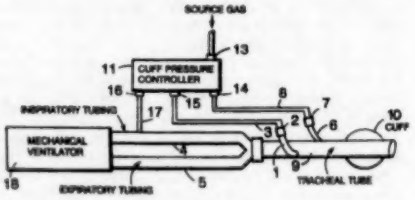
TRACHEAL TUBE CUFF INFLATION CONTROL AND MONITORING SYSTEM

Gary Levinson, Zoar Rd., Rowe, Mass. 01367

Division of Ser. No. 701,450, May 15, 1991, Pat. No. 5,235,973. This application Apr. 20, 1993, Ser. No. 48,911

Int. Cl.[6] A61M *16/00*

U.S. Cl. 128—207.15 **18 Claims**



1. An inflation control system comprising:

a cuff inflation line configured for sealed, fluidic interconnection with an inflatable cuff of a tracheal tube;

an inspiratory tubing monitoring line configured for sealed, fluidic interconnection with inspiratory tubing of a tracheal tube;

an adjustable high pressure relief valve and an adjustable low pressure relief valve, both of which have inlet and outlet ports configured for sealed, fluidic interconnection in series with a source of pressurized gas and said cuff inflation line, both of which also have valved exhaust ports urged toward the closed condition,

a solenoid mounted in series with the exhaust port of the low pressure relief valve, said solenoid arranged to block the exhaust port when said solenoid is activated;

a pressure transducer in sealed, fluidic communication with said inspiratory tubing monitoring line to monitor pressure within said inspiratory tubing monitoring line, said pressure transducer generating an electrical output responsive to pressure within said inspiratory tubing monitoring line; and

a threshold control circuit responsive to said electrical output of said pressure transducer for activating said solenoid.

5,487,384

KINEMATIC ASSAY OF PLASMA GLUCOSE CONCENTRATION WITHOUT BLOOD SAMPLING

Jung J. Lee, Albany, N.Y., assignor to Blue Marble Research, Inc., Albany, N.Y.

Continuation of Ser. No. 22,974, Feb. 25, 1993, abandoned. This application Jul. 8, 1994, Ser. No. 272,317

Int. Cl.[6] A61B *5/00*

U.S. Cl. 128—633 **13 Claims**

1. A method for the determination of an in vivo glucose concentration without blood sampling comprising the steps of:

(a) directing a beam of light to a body part of a patient;

(b) administering a hypoglycemic drug to the patient to impose a kinematic perturbation in the in vivo glucose concentration;

(c) identifying an optical absorption band of in vivo glucose measuring an intensity of a glucose signal;

(d) measuring a rate of decrease of the intensity of the glucose signal with time;

(e) determining an original glucose signal from the rate of decrease measured and

(f) converting the original signal into an original in glucose concentration.

5,487,385

ATRIAL MAPPING AND ABLATION CATHETER SYSTEM

Boaz Avitall, 4868 N. Ardmore Ave., Milwaukee, Wis. 53217

Filed Dec. 3, 1993, Ser. No. 161,920

Int. Cl.[6] A61B *5/04*

U.S. Cl. 128—642 **24 Claims**

3. A recording and ablation catheter system for creating linear lesions in a heart chamber comprising:

(a) a hollow vascular catheter or sheath;

(b) a guide member for aiding the navigation of said catheter or sheath in the vascular system of a patient;

(c) a guide-mounted flexible inner catheter carried by and deployable from a lumen of said vascular catheter or sheath, said inner catheter having a working catheter section having spaced distal and proximal catheter riders having bores adapted to slidably thread over said guide member and being relatively adjustable to each other such that the working catheter section intermediate said distal and said proximal catheter riders is unattached and can be adjustably arcuately flexed according to the relative separation of said rider bores on said guide member to assume a desired shape to address an inner surface of a chamber; and

(d) a plurality of serial electrodes carried by said working catheter section.

5,487,386

ULTRASONIC DIAGNOSTIC APPARATUS

Naoto Wakabayashi; Masayoshi Tsuchiko; Terufumi Akama, all of Tochigi; Hiromi Maekawa, Ootawara; Hiroyuki Shikata, Tochigi; Nobuo Yamazaki, and Tomio Kawaguchi, both of Ootawara, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

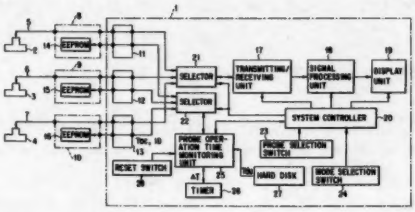
Filed Apr. 21, 1994, Ser. No. 230,697

Claims priority, application Japan, Apr. 22, 1993, 5-095847

Int. Cl.[6] A61B *8/00*

U.S. Cl. 128—660.01 **15 Claims**

1. An ultrasonic diagnostic apparatus for transmitting an ultrasonic wave to an object to be examined and causing an apparatus main body to form an image of tomographic information in the



object obtained through an ultrasonic probe for receiving a wave reflected by the body, comprising:

storage means for storing a cumulative operation time of said ultrasonic probe;

probe operation time monitoring means for measuring a continuous operation time of said ultrasonic probe, and adding the measured continuous operation time to the cumulative operation time stored in said storage means to update the cumulative operation time stored in said storage means; and

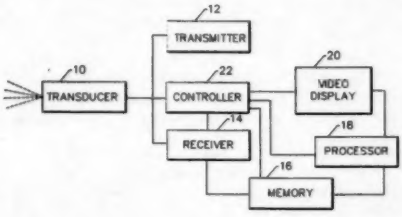
output means for outputting the cumulative operation time updated by said probe operation time monitoring means.

5,487,387

METHOD AND APPARATUS FOR DISTINGUISHING BETWEEN SOLID MASSES AND FLUID-FILLED CYSTS

Gregg E. Trahey, Hillsborough; Phyllis Kornguth, Durham; Kathryn Nightingale, Durham, and William F. Walker, Durham, all of N.C., assignors to Duke University, Durham, N.C.

Filed Jun. 3, 1994, Ser. No. 254,278
Int. Cl.[6] A61B *8/00*
U.S. Cl. 128—660.02 **57 Claims**



1. A method of ultrasonically distinguishing between solid masses and fluid-filled cysts, said method comprising:

transmitting a plurality of ultrasonic transmitting signals into a target lesion located within a human body, wherein at least one of said plurality of transmitting signals is of sufficient intensity to initiate movement of any fluid located within the target lesion;

receiving a plurality of reflected ultrasonic signals from the target lesion;

comparing differences between individual ones of said plurality of reflected signals to detect the presence or absence of fluid movement within the target lesion; and

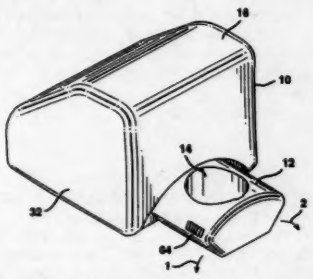
determining whether the target lesion is a fluid-filled cyst or a solid mass based upon the presence or absence of fluid movement within the target lesion.

5,487,388

THREE DIMENSIONAL ULTRASONIC SCANNING DEVICES AND TECHNIQUES

Michael J. Rello, Harleysville, and Richard M. Derman, Newtown, both of Pa., assignors to Interspec. Inc., Ambler, Pa.

Filed Nov. 1, 1994, Ser. No. 333,096
Int. Cl.[6] A61B *8/00*
U.S. Cl. 128—660.09 **15 Claims**



1. A method for ultrasonically scanning a volumetric region within the body of a patient by means of an ultrasonic probe controlled to scan a scan plane through an acoustic cap and a device which moves said probe through an arc of travel, comprising the steps of:

locating said probe and device so that the acoustic cap of said probe is in acoustical contact with the body of the patient;

controlling said device to move said probe through an arc of travel while acquiring ultrasonic information from a plurality of scan planes occupying a wedge shaped volume having an apex which is below the surface of said device which opposes the patient;

recording the positions of said scan planes; and

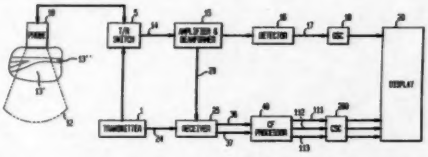
processing the ultrasonic information of said scan planes three dimensionally.

5,487,389

ULTRASONIC DOPPLER IMAGER HAVING AN ADAPTIVE TISSUE REJECTION FILTER WITH ENHANCED TISSUE MOTION SENSITIVITY

Zoran B. Banjanin, Renton, and Jin Kim, Issaquah, both of Wash., assignors to Siemens Medical Systems, Inc., Iselin, N.J.

Filed Dec. 29, 1994, Ser. No. 366,067
Int. Cl.[6] A61B *8/00*
U.S. Cl. 128—661.09 **15 Claims**



1. In an ultrasonic flow imaging and/or measuring system of the type including: a transmitter/receiver arrangement for transmitting a plurality of three or more ultrasonic pulses, for each of a plurality of differently directed beamlines, into an area to be scanned and developing a corresponding plurality of acoustic line signals for each beamline in response to processing of received reflections of said transmitted ultrasonic pulses; a flow processor for processing said acoustic line signals and developing therefrom estimate signals representative of movement in said scanned area; and, a tissue (non-flow) motion rejection arrangement responsive to a control signal representative of tissue movement in said scanned area for preprocessing said acoustic signals provided to said flow processor

so as to suppress tissue movement contributions to said estimate signals, an improvement comprising:

a corner turning memory for receiving and storing said acoustic line signals as a plurality of sequential samples for each acoustic line of each beamline; and

a tissue velocity estimator, coupled to be responsive to samples of said acoustic line signals as provided by said corner turning memory for developing therefrom said control signal, wherein said corner turning memory is caused to provide said acoustic line samples to said tissue velocity estimator in a manner so that all the sequential samples of one or more of said acoustic lines received by said memory are periodically skipped as said memory provides said samples to said tissue velocity estimator.

5,487,390

GAS-FILLED POLYMERIC MICROBUBBLES FOR ULTRASOUND IMAGING

Smadar Cohen, Petach-Tickva, Israel; Alexander K. Andrianov, Belmont, Mass.; Margaret Wheatley, Media; Harry R. Allcock, State College, both of Pa., and Robert S. Langer, Newton, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass., and The Penn State Research Foundation, University Park, Pa.

Continuation-in-part of Ser. No. 880,248, May 8, 1992, Pat. No. 5,308,701, which is a division of Ser. No. 593,684, Oct. 5, 1990, Pat. No. 5,149,543. This application Jan. 14, 1994, Ser. No. 182,216

Int. Cl.[6] A61B *8/14;* **A61K** *9/50*

U.S. Cl. 128—662.02 **20 Claims**

1. A microcapsule having a diameter of 700 microns or less formed of biocompatible hydrogel formed by crosslinking with a multivalent ion of a polymer selected from the group consisting of poly(phosphazenes), poly(acrylic acids), poly(methacrylic acids), copolymers of acrylic acid or methacrylic acid and polyvinyl ethers or poly(vinyl acetate), and sulfonated polystyrene, comprising a gas encapsulated therein in an amount effective for use as an imaging agent.

5,487,391

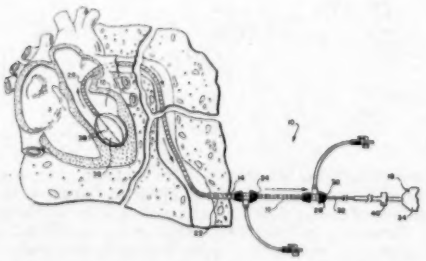
SYSTEMS AND METHODS FOR DERIVING AND DISPLAYING THE PROPAGATION VELOCITIES OF ELECTRICAL EVENTS IN THE HEART

Dorin Panescu, Sunnyvale, Calif., assignor to EP Technologies, Inc., Sunnyvale, Calif.

Filed Jan. 28, 1994, Ser. No. 188,242

Int. Cl.[6] G06F *15/42*

U.S. Cl. 128—699 **32 Claims**



1. A system for examining heart tissue comprising

at least two electrodes,

means for locating the electrodes in contact with a heart tissue region,

means for sensing with the electrodes timing of a local depolarization event in the heart tissue region, and

means for deriving a propagation vector velocity of the depolarization event.

5,487,392

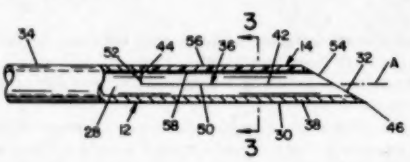
BIOPXY SYSTEM WITH HEMOSTATIC INSERT

John R. Haaga, 4309 N. Hilltop, Chagrin Falls, Ohio 44022

Filed Nov. 15, 1993, Ser. No. 151,914

Int. Cl.[6] A61B *10/00*

U.S. Cl. 123—753 **31 Claims**



1. A biopsy needle for taking a biopsy specimen from a site in a patient comprising an outer tubular cannula having an axis, an inner tubular cannula coaxial with and relatively displaceably received in said outer cannula, a stylet coaxial with and relatively displaceably received in said inner cannula, each said outer and inner cannula and said stylet having a distal portion including a distal end and a proximal portion extending from said distal portion, each said inner cannula and said stylet being axially displaceable relative to said outer cannula between retracted and extended positions in which the distal portions thereof are retracted within the distal portion of said outer cannula in said retracted position and extended axially outwardly spaced from the distal end of said outer cannula to extend into said site in said extended position, said distal portion of said stylet including a cutting recess for severing said specimen at said site, said distal portion of said inner cannula including means for capturing said specimen in said cutting recess, a hemostatic insert supported on said distal portion of said inner cannula for displacement therewith from said retracted to said extended position thereof, said insert being separable from said distal portion of said inner cannula to remain at said site upon removal of said distal portions of said inner cannula and stylet therefrom, and said insert having a radially outer surface means for receiving said insert in said distal portion of said outer cannula in said retracted position of said inner cannula.

5,487,393

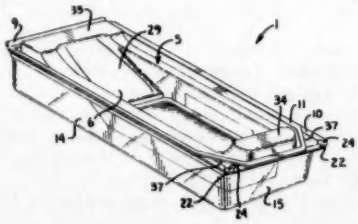
URINE SPECIMEN COLLECTION RECEPTACLE

James S. Haswell, Olathe, and Michael S. Stevens, Lawrence, both of Kans., assignors to Beckwell International, Inc., Olathe, Kans.

Filed Feb. 7, 1994, Ser. No. 192,590

Int. Cl.[6] A61B *5/00*

U.S. Cl. 128—760 **13 Claims**



1. A body fluid collection device comprising:

(a) an outer trough forming a body fluid reservoir;

(b) an inner lid including funnel means;

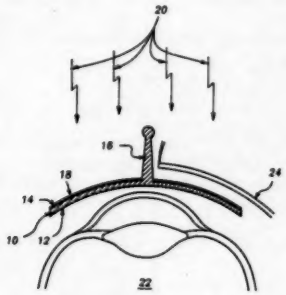
(c) said lid being received on said trough to substantially close said trough and with said funnel means positioned within said trough to direct a fluid from said funnel means into said reservoir;

(d) spout means formed on an edge of said trough to facilitate pouring a fluid from said reservoir to another container;
(e) said trough being rectangular and having corner areas; and
(f) said spout means being formed at one of said corner areas.

5,487,394
TUNGSTEN EYE SHIELDS FOR ELECTRON BEAM TREATMENT

Almon S. Shiu, Bellaire; Samuel S. Tung, Missouri City, and Robert J. Gastorf, Houston, all of Tex., assignors to The Board of Regents of the University of Texas System, Austin, Tex.

Filed Jul. 22, 1994, Ser. No. 278,757
Int. Cl.[6] A61F *5/37;9/00*
U.S. Cl. 128—846 **16 Claims**

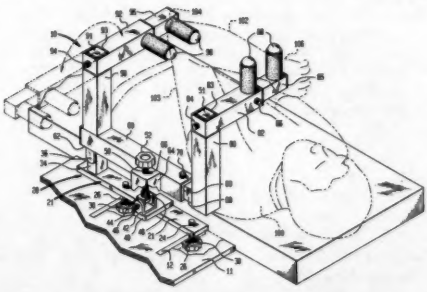


1. An eye shield for insertion between an eye and an eyelid, comprising a tungsten body having a curved inner surface and a curved outer surface, the body being sufficiently thick to attenuate electron beams in the energy range of six to nine million electron volts such that the tolerance doses to different optic structures within an eye are not exceeded and the body being sufficiently thin such that the shield can be inserted between an eye and an eyelid.

5,487,395
APPARATUS FOR SUPPORTING AN ARM

Robert J. Strowe, Ramsey, N.J., assignor to Gait Scan, Inc., Ridgewood, N.J.

Continuation of Ser. No. 160,059, Nov. 30, 1993, abandoned. This application Feb. 2, 1995, Ser. No. 383,617
Int. Cl.[6] A61F *5/37*
U.S. Cl. 128—878 **16 Claims**

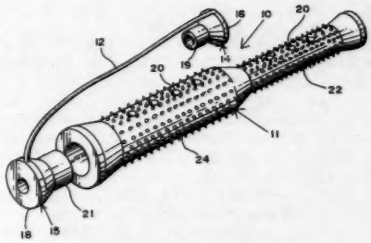


1. An apparatus for supporting an arm comprising:
base means;
first and second vertical support means extending from the base means;
elbow support means attached to the first vertical support means for supporting an elbow, the elbow support means comprising:
a pair of members spaced to support an elbow by the condyles of the humerus;
the pair of members extending generally horizontal with respect to the base means;
the pair of members slideably moveable with respect to each other to vary the space between the pair of members for supporting various sized elbows;
the members positioned generally parallel to each other and maintained in said generally parallel relationship when moved with respect to one another; and
wrist support means attached to the second vertical support means for supporting a wrist.

5,487,396
PERMANENT ROD KIT AND METHOD

Samantha L. Wilson, 6824 114th Pl., Unit D, Miami, Fla. 33173

Filed Jan. 12, 1994, Ser. No. 180,438
Int. Cl.[6] A45D *2/14*
U.S. Cl. 132—248 **8 Claims**



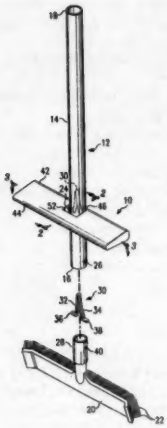
1. A perm rod kit comprising, in combination,
a hollow perm rod body of substantially circular cross-section,
one portion of the body having a diameter larger than the other portion for a loose wrap on the larger diameter portion and tight wrap on the smaller diameter portion,
a band cap and a band plug conformed to penetrate opposite ends of the hollow body of the perm rod,
an elastic band secured to the band cap and the band plug for securing a strand of hair applied to the perm rod body,
and a divider section between the tight wrap and loose wrap sections of the body, which tight wrap and loose wrap sections extend laterally and coaxially in opposite directions from said divider section.

5,487,397
POOL BRUSH HYDROFOIL

Richard A. Bean, 7827 Midbury Dr., Dallas, Tex. 75230

Filed Nov. 29, 1994, Ser. No. 349,995
Int. Cl.[6] F04H *3/16*
U.S. Cl. 134—6 **9 Claims**

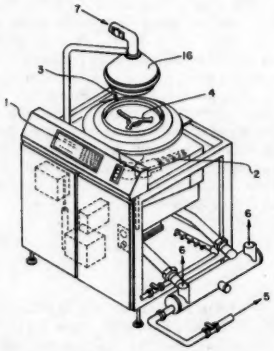
6. A method for cleaning the walls of a pool with a pool brush having a handle and a brush head, the handle having a pair of opposed holes formed therein, comprising the steps of:
inserting a resilient piece in the handle having a pair of engagement pins, each engagement pin passing through one of the opposed holes;
inserting the handle into a notch on a hydrofoil to engage each of the engagement pins with an engagement pin receiving aperture in the hydrofoil to pivotally attach the hydrofoil to the brush handle; and
moving the pool brush along the wall of the pool to alternately pivot the hydrofoil between positions creating a fluid force urging the brush head against the side of the pool to facilitate cleaning.



5,487,398
ROTARY CLEANING METHOD WITH CHEMICAL SOLUTIONS AND ROTARY CLEANING APPARATUS WITH CHEMICAL SOLUTIONS

Tadahiro Ohmi, 1-17-301, Komegabukuro 2-chome, Aoba-ku, Sendai-shi, Miyaga-ken 980; Naomichi Yonekawa, Sendai; Hiroyuki Horiki; Toshimitsu Kaji, both of Tokyo; Fumitomo Kunimoto, Sendai, and Takeo Tamaki, Urawa, all of, Japan, assignors to Tadahiro Ohmi, Miyagi; Nisso Engineering Co., Ltd., Tokyo, and MTC Co., Ltd., Saitama, all of, Japan

Filed Jun. 20, 1994, Ser. No. 262,602
Claims priority, application Japan, Jun. 22, 1993, 5-150897
Int. Cl.[6] B08B *3/04*
U.S. Cl. 134—95.1 **14 Claims**

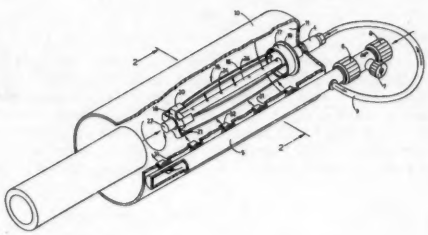


1. A cleaning apparatus comprising at least:
a cleaning bath having a movable cover at its top for sealing the bath by closing the cover;
object-to-be-cleaned holding means for holding an object to be cleaned in the cleaning bath;
rotating means for rotating the object-to-be-cleaned holding means;
gas introducing means for introducing gas into the cleaning bath;
a first nozzle for feeding a first chemical solution to the surface of an object to be cleaned held by the object-to-be-leaned holding means;
a second nozzle for feeding a second chemical solution to the surface of an object to be cleaned held by the object-to-be-cleaned holding means;
a third nozzle for spraying a first chemical solution onto the back of an object to be cleaned held by the object-to-be-cleaned holding means;
a fourth nozzle for spraying a second chemical solution onto the back of an object to be cleaned held by the object-to-be-cleaned holding means;
a fifth nozzle for feeding ultrapure water to the surface of an object to be cleaned held by the object-to-be-cleaned holding means;
a sixth nozzle for spraying ultrapure water onto the back of an object to be cleaned held by the object-to-be-cleaned holding means;
a chemical solution feed line connected to each of the first to the fourth nozzles;
an external chemical solution feeder connected to each chemical solution feed line for feeding a chemical solution;
an ultrapure water feed line connected to the fifth and sixth nozzles;
ozone adding means for selectively adding ozone to ultrapure water; and
a drainage line for completely assorting waste liquids after cleaning.

5,487,399
PAINT ROLLER CLEANER

Dale A. Hannah, 13260 Welch St., Waterford, Calif. 95386

Filed Mar. 23, 1995, Ser. No. 409,860
Int. Cl.[6] B08B *3/02*
U.S. Cl. 134—138 **8 Claims**



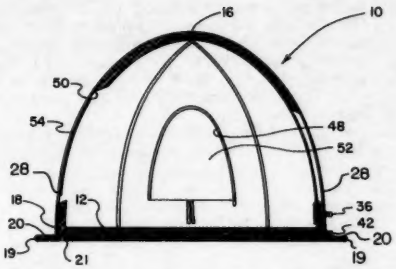
1. A paint roller pad cleaning device comprising:
a. a hollow cylindrical housing that is closed on one end having a plurality of openings longitudinally spaced along the outside thereof;
b. a first hollow shaft shiftably attached to the outside of said housing, said shaft having a plurality of sprayers mounted thereon corresponding to said longitudinal openings, said sprayers pointing to the inside of said housing;
c. a valve means and water source attached to said first shaft;
d. a rotatable paint roller pad support frame centrally attached inside said housing, said frame surrounding a second fixed hollow shaft attached to the closed end of said housing;
e. a plurality of spray openings in said second shaft; and
f. a conduit means for connecting said first shaft to said second shaft.

5,487,400
SELF-INFLATING TENTS

Katherine J. Dawkins, #1-168 Indian Rd Cres, Toronto, Ontario, Canada

Filed Mar. 14, 1994, Ser. No. 212,050
Int. Cl.[6] E04B *1/34*
U.S. Cl. 135—87 **1 Claim**

1. A new and improved self-inflating tent comprising, in combination:



a mattress having a top and bottom side of a circular configuration, the bottom side having a circular sheet attached thereto having a diameter larger than a diameter of the mattress;

a dome shaped tent having a lower peripheral edge secured to the mattress adjacent to the bottom side providing a flange at an outer most periphery of the tent to constitute a ground rim;

the material of the tent and mattress being fabricated of an open cell polyurethane capable of unaided air expansion, the open cell polyurethane being enclosed by an exterior and interior liner of an air impervious flexible plastic;

a first valve coupled to the tent to allow the flow of air into the open cells of the tent material and to expand the tent material, the first valve also allowing air to exit therefrom the tent material when the tent material is compressed and the first valve is opened;

a second valve coupled to the mattress and passing through the lower peripherial edge of the tent to allow flow of air into the mattress material the second value also allowing air to exit therefrom the mattress material when the mattress material is compressed and the second valve is opened;

a plurality of grommets extending though the ground rim securing the mattress and tent in a predetermined location;

apertures formed in the tent, said apertures having windows and doors located therein; and

a carrying bag for receiving the tent and mattress when in a collapsed and folded orientation.

5,487,401

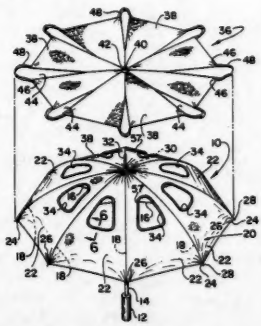
WINDPROOF UMBRELLA

Johnson, Gary D., New York, and Stanley Hochfeld, Howard Beach, both of N.Y., assignors to Leonard Holtz, New York, N.Y.

Continuation of Ser. No. 730,783, Jul. 24, 1991, Pat. No. 5,368,055, which is a continuation-in-part of Ser. No. 309,620, Feb. 10, 1989, Pat. No. 4,979,534. This application Nov. 15, 1994, Ser. No. 340,079

Int. Cl.[6] A45B *25/22*

U.S. Cl. 135—33.7 **7 Claims**



1. A windproof umbrella comprising:

a post having a lower end to be grasped by a user and an opposite upper end;

a plurality of ribs extending outwardly in a radial direction from said upper end of said post, each rib having a free end portion;

a lower canopy secured in covering relation on said ribs, said lower canopy including a plurality of vent holes therethrough, said vent holes being arranged between said post and said free end portions of said ribs, and said vent holes having upper peripheral portions at portions of said vent holes closest to said upper end of said post, and said vent holes having lower peripheral portions at portions of said vent holes closest to said free end portions of said ribs;

an upper canopy positioned over said lower canopy in covering relation to all of said vent holes;

said upper canopy extending from said post to an area below said lower peripheral portions of said vent holes and said upper canopy having a lower peripheral edge extending below lower extremities of said vent holes, said upper canopy being held in a fixed position in the vicinity of said post;

a plurality of elastic members coupling said upper canopy to said ribs in the vicinity of said free end portions of said ribs, for thereby securing said upper canopy between said upper end of said post and the vicinity of said free portions of said ribs with an elastic tautness and to permit at least a lower peripheral edge portion of said upper canopy to elastically separate from said lower canopy while also covering all of said vent holes to prevent rain water from entering said vent holes from above the umbrella.

5,487,402

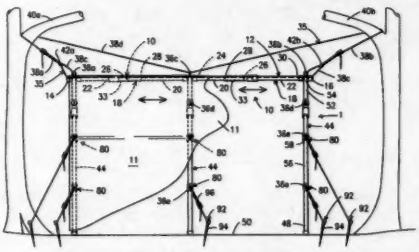
PORTABLE SHELTER WITH EXPANDABLE FRAME

Michael S. Clary, P.O. Box 2544, Crystal River, Fla. 34423, assignor to Michael S. Clary, and Cynthia G. Clary, both of Crystal River, Fla.

Filed Aug. 11, 1994, Ser. No. 289,014

Int. Cl.[6] E04H *15/04*

U.S. Cl. 135—87 **20 Claims**



1. A portable shelter erectable on a support surface, said shelter comprising:

a frame further comprising;

a ridge pole, having a first end and a second end, said ridge pole further comprising at least one section, said section comprising a first part and a second part, said second part slideably engaging said first part such that said ridge pole is extendable between an expanded position and a retracted position;

a plurality of posts, each said post having a first end attached to said ridge pole and a second end engaging a support surface; and

a lifting means comprising a first joining means attached to said first end of said ridge pole and a second joining means attached to said second end of said ridge pole; a first line having a first end connected to said first joining means and having a second end attached to a first support means at a point in a horizontal plane that lies above said ridge pole; a second line having a first end connected to said second joining means and having a second end attached to a second support means at a point in a horizontal plane that lies above said

ridge pole, the first support means being spaced apart from the second support means, whereby a lifting force is applied to said ridge pole.

5,487,403

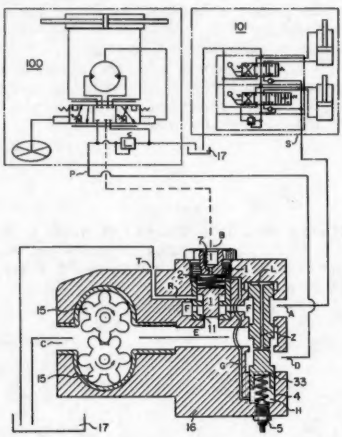
VARIABLE DISCHARGE PUMP WITH LOW UNLOAD TO SECONDARY

James R. Mollo, 209 Julrich Ave., McMurray, Pa. 15317

Continuation-in-part of Ser. No. 121,275, Sep. 13, 1993, Pat. No. 5,368,061, which is a continuation-in-part of Ser. No. 784,388, Oct. 29, 1991, Pat. No. 5,244,358, which is a continuation-in-part of Ser. No. 426,750, Oct. 24, 1989, abandoned, which is a continuation-in-part of Ser. No. 211,163, Jun. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 8,313, Jan. 29, 1987, abandoned. This application Nov. 28, 1994, Ser. No. 346,607

Int. Cl.[6] **F15B** *13/06*

U.S. Cl. 137—115 **10 Claims**



1. A load sensed variable output gear pump system comprising:

a housing;

a fluid delivery pump within said housing having an inlet and an outlet;

a main inlet passage located in said housing and extending to said inlet of said pump;

a main outlet passage located in said housing and extending from said outlet of said pump, whereby fluid in said main outlet passage is pressurized by said fluid delivery pump;

a secondary outlet passage located in said housing;

a bypass outlet passage located in said housing and adapted to be connected to a reservoir;

a load sensed passage located in said housing and connected to load pressure;

a first control means for controlling flow through said secondary outlet passage from said main outlet passage, said first control means including:

i) a first chamber located in said housing having a first chamber inlet opening connected to said main outlet passage, a first chamber outlet opening connected to said secondary outlet passage, a first chamber load opening connected to said load sensed passage and a first chamber bypass opening connected to said bypass outlet passage, and

ii) a plunger movably positioned within said first chamber and movable between a first position closing said first chamber inlet opening and a second position spaced from said first chamber inlet opening for allowing fluid to flow through said first chamber inlet opening between said main outlet passage and said secondary outlet passage, said plunger having an effective surface area ratio of 2:1 between an area of said plunger acted upon by pressure from said load sensed passage and an area of said plunger acted upon by pressure from said main outlet passage, wherein said plunger is in said second position when no pressure is applied to said load sensed passage, whereby said main outlet passage is connected to said secondary outlet passage; and

a second control means for controlling flow through said secondary outlet passage from said main outlet passage, said second control means including:

i) a second chamber located in said housing having a second chamber inlet opening connected to said main outlet passage, a second chamber outlet opening connected to said secondary outlet passage and a second chamber load opening,

ii) a spool within said second chamber movable between a first position closing said second chamber inlet opening and a second position spaced from said second chamber inlet opening allowing fluid to flow through said second chamber inlet opening between said main outlet passage and said secondary outlet passage, said spool having an effective surface area of 1:1 between an area of said spool acted upon by pressure from said load sensed passage and an area of said spool acted upon by pressure from said main outlet passage, and

iii) a spring biasing said spool towards said first position, wherein said spool is in said first position when no pressure is applied to said fluid load sensed passage.

5,487,404

VALVE FOR A TAP OF A COMPRESSED OR LIQUIFIED GAS CYLINDER, AND TAP PROVIDED WITH SUCH A VALVE

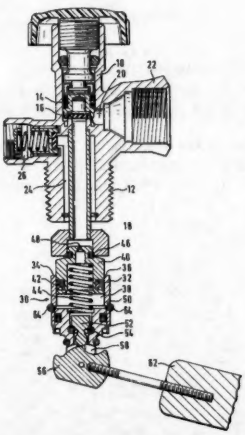
Leon Kerger, Helmdange, Luxembourg, assignor to Torrent Trading Ltd., Toltola, Virgin Islands (Br.)

Filed Jul. 12, 1994, Ser. No. 273,920

Claims priority, application Luxembourg, Jul. 12, 1993, 88379

Int. Cl.[6] **F16K** *31/24;31/34;33/00*

U.S. Cl. 137—413 **6 Claims**



1. Two-way valve for a tap of a gas cylinder, which valve is intended to be fitted on a selectively operable inlet pipe (**18**) of the tap, said two-way valve (**30**) permitting both filling and draining of the gas cylinder and comprising a casing (**32**) with at least one lateral opening (**34, 36**) which can be sealed off by a sealing device (**40**) provided with a passage (**48**) for gas, resiliently yieldable means (**44**) for displacing the sealing device (**40**) to a position of obstruction of the openings (**34, 36**) and for permitting the sealing device (**40**) to move to a position of opening against the action of

the resiliently yieldable means (44) through the effect of the pressure of the filling gas, a level-controlling valve (52) movable between open and closed positions and operable, when in said open position, to permit gas to flow between the gas cylinder and the passage (48), and means (62) for detecting the filling level in the gas cylinder and for actuating the level-controlling valve (52) in response to such level, said level-controlling valve, when not held in an open position by said detecting means (62), being operable by the pressure of the gas in the cylinder when the pipe (18) is open, characterized by at least one orifice (50) disposed in at least one of a wall portion of the inlet pipe (18) and a wall portion of the casing (32) for establishing communication between the inside of the casing (32) and the inlet pipe (18), on the one hand, and the inside of the cylinder, on the other hand, said orifice (50) being associated with resilient vent means (64) which resist the maximum filling pressure in order to ensure the leak tight closure of the orifice (50) and which yield at a pressure greater than the maximum filling pressure in order to open the orifice (50) to prevent pressure from building up within either one of the inlet pipe (18) and the casing (32).

5,487,405

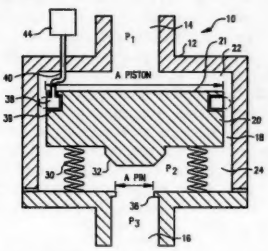
FLOW CONTROL VALVE HAVING FLOW ADJUSTABLE BY VARIABLE RING

Paul K. Skoglund, 2222 - 79th Ave. NE., Bellevue, Wash. 98004

Continuation-in-part of Ser. No. 69,459, Jun. 1, 1993, Pat. No. 5,301,713. This application Apr. 7, 1994, Ser. No. 224,477

Int. Cl.[6] G05D *7/01*

U.S. Cl. 137—501 **18 Claims**



1. A valve comprising:

a housing having an inlet and outlet defining a flow passage through said housing, divided into a first chamber and a second chamber, and having an inner wall;

a piston mounted in a bore in said flow passage, said piston having an outer wall and cooperating with said outlet to alter the flow area through said outlet; spring means biasing said piston toward said inlet; and

means encircling at least one of said inner wall of said housing and said outer wall of said piston and having an alterable cross-sectional area for altering fluid flow between said inner wall of said housing and said outer wall of said piston.

5,487,406

DRAIN CONTROL VALVE AND MANIFOLD SYSTEM

James D. Jirasek, 109 S. 31st St., Temple, Tex. 76504

Filed Sep. 30, 1994, Ser. No. 315,510

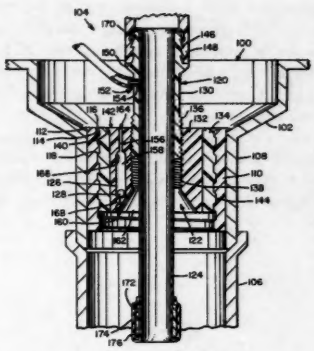
Int. Cl.[6] F16K *15/14;37/00;* **D06F** *39/08*

U.S. Cl. 137—519 **20 Claims**

1. A valve, comprising:

a valve body having a rigid wall defining inlet and outlet openings at opposite ends thereof and a main flow passageway between said inlet and outlet openings;

a tubular valve member of elastomeric material having upstream and downstream ends in fluid communication with one another, said upstream end secured to said rigid wall so as to



receive fluid entering said passageway through said inlet opening, said tubular valve member being normally open to fluid flow but being yieldingly collapsible in response to downstream pressure increases to prevent fluid from passing therethrough; and,

a ring secured about said tubular valve member, said ring dimensioned to prevent the passage of said downstream end through said inlet opening in the event of a downstream pressure increase.

5,487,407

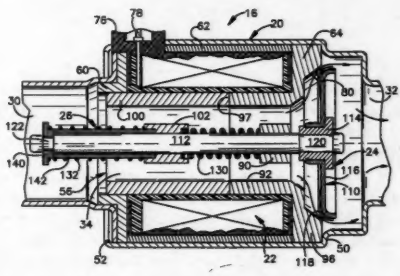
SOLENOID CONTROLLED ONE-WAY VALVE

Garlan L. Eaker, Louisville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 1, 1994, Ser. No. 348,540

Int. Cl.[6] F16K *15/00;31/02*

U.S. Cl. 137—522 **11 Claims**



1. A valve assembly for affecting fluid flow in a system comprising:

a valve housing defining flow openings at opposite ends thereof and a valve seat structure;

a valving member comprising a valving element positioned for engagement with said valve seat and a stem element fixed to and projecting from said valving element, said valving element movable between an open position spaced from said valve seat for enabling fluid flow through said housing and a closed position engaged with said valve seat;

a solenoid assembly comprising an armature movable with respect to said valving member and said valve housing, said solenoid having an energized condition wherein said armature is subjected to an electromagnetic force and a deenergized condition;

first and second spring elements reacting against said valving member, at least one spring element engagable with said armature;

said first and second spring elements coacting to produce a net spring force maintaining said valving member in one of said positions in the presence of system fluid pressure forces in a given range above a predetermined system net pressure force tending to shift the valving member toward the other position when said solenoid assembly is de-energized;

said solenoid assembly energized to shift said armature for substantially reducing the net spring force applied to said valving member for enabling system fluid pressure forces in said range to shift said valving member toward said other position.

5,487,408

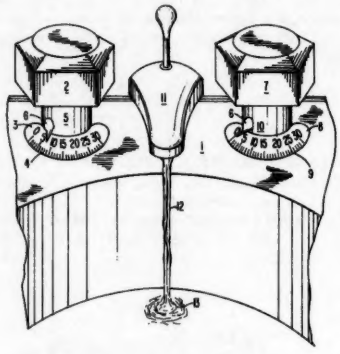
WATER SINK SYSTEM

Naum Pokhis, 1132 S. Doheny, Los Angeles, Calif. 90035

Filed Nov. 30, 1994, Ser. No. 346,870

Int. Cl.[6] F16K *11/18*

U.S. Cl. 137—556.3 **1 Claim**



1. A water sink system, comprising a water discharge member; two rotatable knobs for allowing hot water and cold water to flow into the water discharge member and meet there to produce discharged water with a desired temperature; a scale provided near each of the turnable knobs and having a plurality of graduation marks; and a pointer provided on each of said turnable knobs and turnable with the latter, so that when a user by turning the turnable knob reaches a desired temperature, each pointer points to a respective graduation mark of each scale, which graduation marks can be memorized by a user and thereafter he can turn said knobs immediately to the memorized graduation marks, so that the hot water and the cold water are mixed correspondingly and mixed water is discharged from said water discharge member with a desired temperature, each of said scales having a lower surface provided with an adhesive layer so that each of said scales can be attached to a supporting element of the water sink system by said adhesive layer, each of said pointers having a substantially horizontal pointed part and a substantially vertical arced part, said substantially vertical arced part being of one piece with said substantially horizontal pointed part and surrounding a turning part of each of said knobs, said substantially vertical arced part of each of said pointers having an inner surface provided with an adhesive layer so that each of said pointers can be attached to said turning part of a respective one of said knobs by aid adhesive layer provided on said inner surface of said arced point of each of said pointers.

5,487,409

SPOOL VALVE

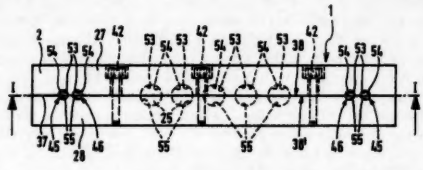
Kurt Stoll, Esslingen, Germany; Jan R. de Fries, Wallisellen, Switzerland, and Herbert Köngeter, Reichenbach, Germany, assignors to Festo KG, Esslingen, Germany

Filed Jul. 1, 1994, Ser. No. 269,759

Claims priority, application Germany, Jul. 24, 1993, 43 24 939.6

Int. Cl.[6] F15B *13/042*

U.S. Cl. 137—625.64 **18 Claims**



1. A spool valve comprising a valve housing in whose interior an axially extending spool receiving means is provided, in which a spool is located, the valve housing being longitudinally divided adjacent to the spool receiving means and having a plurality of housing parts fitted together along longitudinal sides thereof, a sealing arrangement adapted to function to define flow paths in the valve between the spool and a wall integral with the housing, and valve ducts serving to direct a working fluid, said ducts extending in the wall of the valve housing, wherein at least one length portion of each valve duct extends in a parting interface of the valve housing, the parting interface comprising a parting plane in which at least two parts of the valve housing are adjacent to one another, the length portion of the valve duct being composed of complementary wall peripheral sections, which are provided in the parting interface on the housing parts adjoining each other on longitudinal sides thereof, wherein at one axial end part at least of the spool receiving space a drive space is provided arranged in the interior of the longitudinally divided valve housing, the drive space serves to receive an actuating member adapted to be fluid driven by means of a control pressure medium, said actuating member serving for operation of the valve spool, and opens into a drive valve duct serving for the supply of the control pressure medium, said drive valve duct having its entire length extending in the parting interface and opens at an end opposite to the associated drive space at an external surface of the valve housing.

5,487,410

PROPORTIONAL SOLENOID VALVE UNIT

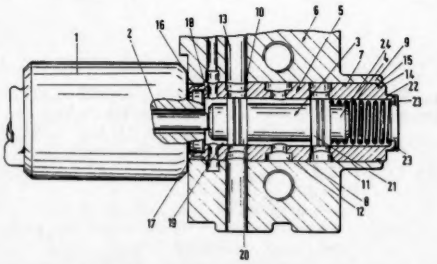
Bernd Niethammer, Nürtingen, Germany, assignor to Hydraulik-Ring Antriebs- und Steueringstechnik GmbH, Nürtingen, Germany

Filed Feb. 10, 1995, Ser. No. 386,377

Claims priority, application Germany, Feb. 10, 1994, 9402205 U

Int. Cl.[6] F16K *31/04*

U.S. Cl. 137—625.65 **9 Claims**

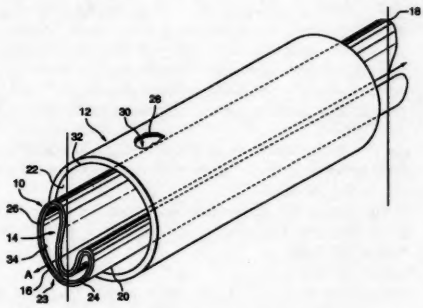


1. A proportional solenoid valve unit comprising:

a casing with a receiving chamber;

a valve housing received in said receiving chamber;
a solenoid with a pushrod connected to said valve housing;
a piston positioned in said valve housing so as to be slidable;
at least one pressure spring positioned at one end of said piston opposite said solenoid;
said piston displaceable by said pushrod of said solenoid against the force of said at least one pressure spring;
said receiving chamber having a longitudinal extension and a constant diameter along said longitudinal extension; and
flange means for connecting said valve housing to said casing and said solenoid.

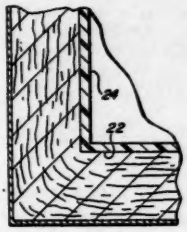
5,487,411
LINER PIPE FOR REPAIR OF A HOST PIPE
Joseph E. F. Goncalves, Mississauga, Canada, assignor to Ipex Inc., Toronto, Canada
Filed Nov. 22, 1994, Ser. No. 345,727
Int. Cl.[6] F16L *55/16*
U.S. Cl. 138—98 **12 Claims**



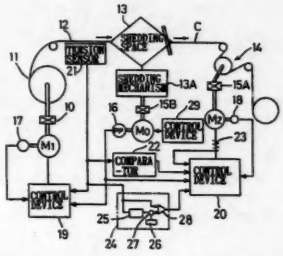
1. A liner pipe for repair of a host pipe;
the liner pipe having a hollow inside; a length defining a longitudinal axis; and a cross-sectional shape and size in a plane transverse to the longitudinal axis;
the cross-sectional shape and size of the liner pipe being such that the liner pipe can be fed through the host pipe; the liner pipe comprising an inner layer and an outer
the outer layer being comprised of flexible thermoplastic material; and
the inner layer being comprised of rigid thermoplastic material which, when softened by heating to attain a flexibility similar to that of the outer layer, becomes sufficiently pliable to allow the cross-sectional shape and size of the liner pipe to conform to an inner cross-sectional shape and size of the host pipe.

5,487,412
GLASS FIBER AIRDUCT WITH COATED INTERIOR SURFACE CONTAINING A BIOCIDE
Kent R. Matthews, Littleton; Eric G. Schakel, Sedalia, and Ricardo R. Gamboa, Littleton, all of Colo., assignors to Schuller International, Inc., Denver, Colo.
Continuation-in-part of Ser. No. 67,769, May 26, 1993, Pat. No. 5,379,806. This application Nov. 9, 1994, Ser. No. 337,586
Int. Cl.[6] F16L *9/14*
U.S. Cl. 138—149 **4 Claims**

1. A glass fiber airduct for conveying an airstream comprising: a rigid, glass fiber duct formed of duct board having a density of at least 3.5 pounds per cubic foot; said glass fiber duct having an interior surface adapted to be in contact with an airstream; said interior surface of said glass fiber duct having a polymeric coating layer comprising a polymeric coating of a surface of said duct board; said polymeric coating having a dry solids content between 10 and 20 grams per square foot of said duct board surface; said polymeric coating layer having an inorganic biocide to prevent microbiological growth on said interior surface of said glass fiber duct; and said polymeric coating layer retaining its abrasion strength and puncture resistance after being subjected to a temperature of 250° Fahrenheit for 60 days whereby said interior surface of said glass fiber duct can be cleaned without exposing glass fibers to the airstream.



5,487,413
METHOD FOR RESTARTING THE OPERATION OF AN AIR JET LOOM, AFTER DEFECTIVE WEFT REMOVAL
Kunio Hatakeyama, Minato, and Yoshihiko Habu, Kanazawa, both of, Japan, assignors to Kabushiki Kaisha Ishikawa Seisakusho, Ltd., Kanazawa, Japan
Filed Oct. 18, 1994, Ser. No. 324,615
Int. Cl.[6] D03D *51/08;47/34*
U.S. Cl. 139—116.2 **2 Claims**



1. A method for restarting the operation of an air jet loom which is provided with a pick finding device and an improper weft removing device, wherein a loom, a let-off motion and a take-up motion each have their own independent driving source, for removing an improper weft when there occurs an error in a picking motion in an air jet weaving operation, comprising steps in the following order of:
a. stopping the loom at approximately 300° with respect to the rotational angle of a main shaft, and then rotating the loom in a reverse direction from 300° to approximately 30° with respect to the rotational angle of the main shaft;
b. cutting an improper weft stretching from a main nozzle into a shedding motion with a cutter provided adjacent to the main nozzle;
c. operating the loom in a normal rotational direction from 30° to approximately 140° with respect to the rotational angle of the main shaft;
d. operating the pick finding device to separate the main shaft and the shedding motion, and once again connecting the main shaft and the shedding motion after reversely rotating only a harness frame for 360°;
e. removing an improper weft remaining in the shedding motion with the improper weft removing device, and inserting a new weft into the shedding motion by injecting pressurized air from the main nozzle;

f. operating the take-up motion in normal rotation while the loom is stopped, and at the same time, rotating the let-off motion in reverse rotation, wherein a ratio between said normal and said reverse rotations is from 1:7 to 1:3; and

g. restarting the weaving operation by simultaneously starting the loom, take-up motion and let-off motion.

5,487,414

DOUBLE LAYER PAPER-MAKING FABRIC

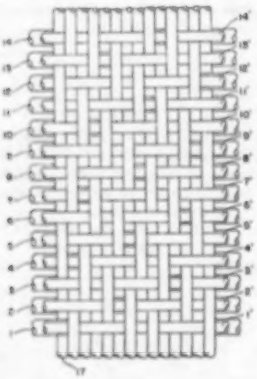
Takehito Kuji, Tokyo, and Tatsuhiko Yasuoka, Shizuoka, both of, Japan, assignors to Nippon Filcon Co., Ltd., Tokyo, Japan

Filed Sep. 1, 1994, Ser. No. 297,567

Claims priority, application Japan, Sep. 6, 1993, 5-254624

Int. Cl.[6] D03D *23/00*

U.S. Cl. 139—383 A **18 Claims**



1. A paper-making fabric having a plurality of repeating design units, each of the repeating design units comprising fourteen yarns or more for each of warps, upper wefts and lower wefts, each of the upper wefts being extended in parallel over each of the lower wefts, wherein, in a first repeating design unit, a first lower weft being interwoven with a warp at a first position, a first and a second upper wefts which are adjacent to each other being interwoven with the warp at a third position, a third and a fourth upper wefts which are adjacent to each other being interwoven with the warp at a fourth position, further wherein the number of upper or lower wefts disposed between the first position and the third position and the number of upper or lower wefts disposed between the fourth position and the first position of a second repeating design unit subsequent to the first repeating design unit are the same, and the warp travels in a substantially linear manner between upper and lower wefts disposed between the third position and the fourth position.

5,487,415

WEFT FEEDER WITH RETHREADING AND BRAKING DEVICES

Bruno Mainp, Vigliano Biellese, Italy, assignor to Roj Electrotex S.p.A., Biella, Italy

PCT No. PCT/EP92/00834, § 371 Date May 23, 1994, § 102(e) Date May 23, 1994, PCT Pub. No. WO/9306277, PCT Pub. Date Apr. 1, 1993

PCT Filed Apr. 13, 1992, Ser. No. 211,123

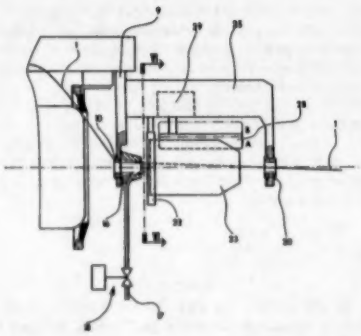
Claims priority, application Italy, Sep. 19, 1991, VC91U0010

Int. Cl.[6] D03D *47/34*

U.S. Cl. 139—452 **4 Claims**

1. Weft feeder for gripper or projectile looms, comprising:

a body means for housing a motor;



a drum mounted on a motor shaft and held stationary, around which a winding arm rotated by the motor winds up a weft yarn reserve;

an extension of said body means carrying sensors to detect and control the weft yarn reserve being wound on the drum;

brake means, in the form of a ring with an annular brush, for braking weft yarn against an end surface of the drum;

pneumatic means for restoring the continuity of the weft yarn from a feed spool to a loom, in case of yarn breakage or interruption;

a first compressed air nozzle means, positioned at an inlet of the weft feeder, for introducing therein a new weft yarn fed from the feed spool; and

yarn launching and guiding means for introducing the new weft yarn into a first yarn, guide eyelet centered on a longitudinal axis of the drum;

characterized in that,

downstream of said first yarn guide eyelet (**10**), there are mounted a separating element (**28**, **42**) to open apart two brake leaves (**23**) of a double-leaf brake (**21**), and a second yarn guide eyelet (**20**), said separating element (**28**, **42**) being controlled by an actuator (**29**, **39**, **43**) so as to form a duct (**32**) to guide the weft yarn (**1**) from the first yarn guide eyelet (**10**) to the second yarn guide eyelet (**20**).

5,487,416

LEAD CONDITIONING SYSTEM FOR SEMICONDUCTOR DEVICES

James E. Maksim, Santa Clara, Calif., assignor to Precision Technologies, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 806,054, Dec. 11, 1991, Pat. No. 5,273,081. This application Dec. 3, 1993, Ser. No. 147,874

The portion of the term of this patent subsequent to Dec. 28, 2010, has been disclaimed.

Int. Cl.[6] B21F *01/02*

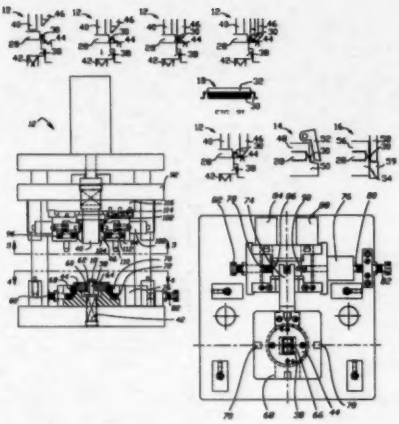
U.S. Cl. 140—105 **24 Claims**

1. An apparatus for conditioning the bent leads of a semiconductor device of the type normally having parallel leads projecting from a body in a predetermined configuration comprising:

means for engaging and massaging said leads to reintroduce a predetermined spacing between each of said leads projecting from said body to bring said leads into parallelism;

means for forming said leads to a partially unbent condition, said forming means including a support formed to receive said semiconductor device and at least one arm pivotal between a first position spaced from said leads and a second position compressing a portion of said leads between said arm and said support; and

means for reforming said leads to said predetermined lead configuration.



5,487,417

ELECTROLYTE INJECTION APPARATUS

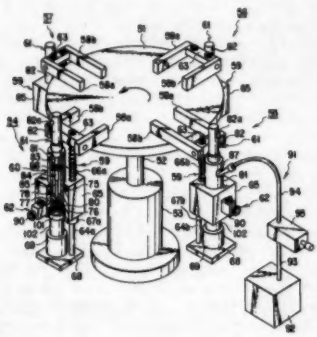
Shigeo Kasahara; Kiyoshi Sueoka; Gen Takayama; Shingo Satoh, and Hidemi Houjyou, all of Tokyo, Japan, assignors to Toshiba Battery Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1994, Ser. No. 298,679

Claims priority, application Japan, Sep. 3, 1993, 5-219898; Aug. 9, 1994, 6-187396

Int. Cl.[6] H01M 4/82

U.S. Cl. 141—32 15 Claims



1. An electrolyte injection apparatus comprising:

a rotary table;

an electrolyte injection member supported by said rotary table so as to be tilted by a centrifugal force upon rotation of said rotary table, said injection member having an internal hole whose bottom section is tapered, and a small-diameter exit hole formed in a lower end thereof and communicating with said internal hole;

a battery which contains no electrolyte and in which an electrode group consisting of a laminated structure formed by interposing a separator between positive and negative electrodes is accommodated in a case such that a lamination plane of said electrode group is parallel to a direction of depth of said case;

holding means for holding said battery; and

electrolyte supply means for supplying an electrolyte to said injection member;

wherein said holding means holds said battery below said injection member such that a lower region of said exit hole of said injection member is situated inside an opening of said case of said battery, with a desired distance maintained between the lower region of said exit hole and an upper end of said electrode group.

5,487,418

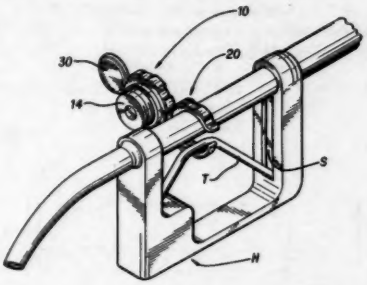
GAS CAP CONSTRUCTION

Bernard Reyes, 510 Mokauea St., Honolulu, Hi. 96819-3231

Filed Oct. 11, 1994, Ser. No. 320,668

Int. Cl.[6] B65D 51/24

U.S. Cl. 141—392 3 Claims



1. An improved gas cap construction comprising:

a main cap body portion;

means for engaging a tank throat extending from one side of said cap body;

a raised disk on said cap body being located and hinged on the side opposite said tank throat engagement means, said disk thus defining a first generally planar cap portion surface of said disk and a second generally planar cap portion surface of said disk, said first surface and said second surface being substantially parallel to one another; and

a clamp portion hingedly attached to said body portion, said clamp portion and a hinged attachment being configured such that said clamp portion is positionable to lie in a plane substantially parallel to that of both said first surface and said second surface: whereby

said improved cap is removable from a throat of a gas tank, and where said clamp portion is movable to a position wherein it's usable to maintain the handle of a gas pump in an operable position and said disk is movable to a position wherein it's usable to maintain the handle of a gas pump in an operable position.

5,487,419

REDISPERSIBLE MICRODENOMINATED CELLULOSE

Michael K. Weibel, West Redding, Conn., assignor to Microcell, Inc., West Redding, Conn.

Filed Jul. 9, 1993, Ser. No. 89,682

Int. Cl.[6] D21C 9/00

U.S. Cl. 162—9 10 Claims

1. A process for preparing dry, redispersible microdenominated cellulose comprising microdenominated cellulose prepared by repeatedly passing a liquid suspension of cellulose through a zone of high shear, said zone being defined by two confronting surfaces, with one of said surfaces rotating relative to the other, until said cellulose suspension is rendered substantially stable and has a Canadian Standard Freeness that consistently increases with repeated passage through said zone of high shear, said microdenominated cellulose having a settled volume of greater than 50% as determined on the basis of a 1.0% by weight suspension in water after twenty-four hours and drying said suspension of microdenominated cellulose in the presence of a dispersion agent in an amount effective to impart to said dry microdenominated cellulose a viscosity, when dispersed in water, of at least 50% of

the viscosity of an equivalent concentration of never dried microdenominated cellulose dispersed in water.

5,487,420

METHOD FOR FORMING METAL MATRIX COMPOSITE BODIES BY USING A MODIFIED SPONTANEOUS INFILTRATION PROCESS AND PRODUCTS PRODUCED THEREBY

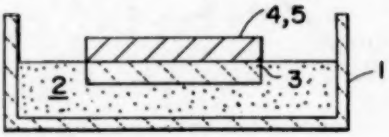
Marc S. Newkirk, Newark, Del., assignor to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 60,467, May 11, 1993, abandoned, which is a continuation of Ser. No. 806,847, Dec. 9, 1991, abandoned, which is a continuation of Ser. No. 520,923, May 9, 1990, abandoned. This application May 4, 1994, Ser. No. 238,183

The portion of the term of this patent subsequent to Nov. 10, 2008, has been disclaimed.

Int. Cl.[6] **B22D** *19/14;19/00*

U.S. Cl. 164—97 **22 Claims**



1. A method for forming a metal matrix composite, comprising:

providing a permeable mass comprising a preform or a filler material;

separately placing physically distinct bodies of a matrix metal and a non-infiltrating metal each in contact with at least one surface of the permeable mass at different locations thereon; and

spontaneously infiltrating at least a portion of said permeable mass with said matrix metal in a molten condition, thereby causing said non-infiltrating metal to infiltrate at least a portion of said permeable mass substantially contiguous with said molten matrix metal.

5,487,421

STRIP CASTING APPARATUS WITH ELECTROMAGNETIC CONFINING DAM

Howard L. Gerber, Chicago, Ill., assignor to Inland Steel Company, Chicago, Ill.

Filed Jun. 22, 1994, Ser. No. 263,874

Int. Cl.[6] **B22D** *11/06;27/02*

U.S. Cl. 164—467 **30 Claims**

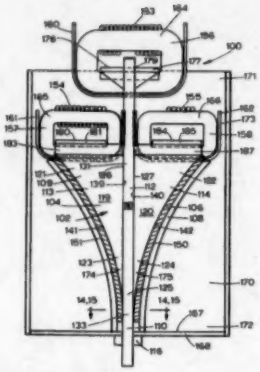
1. An electromagnetic dam for preventing the escape of molten metal through the open end of a vertically extending gap located between two horizontally disposed, counter-rotating casting rolls comprising means for containing a pool of molten metal, said dam including a confining coil having a first part for disposition adjacent said casting rolls, said first part of the confining-coil comprising the following components:

a first vertically disposed, central conductor portion having a pair of opposite sides:

a pair of wedge-shaped, vertically disposed conductor portions, each located on a respective opposite side of said first central conductor portion, in close, substantially abutting relation thereto;

and means for electrically insulating said wedge-shaped conductor portions from said first central conductor portion;

said first central conductor portion having a relatively narrow front surface disposed between said pair of opposite sides and comprising means for facing the open end of said gap, said front surface having a lowermost part;



each of said wedge-shaped conductor portions having a front surface tapering in width from a relatively wide upper part to a relatively narrow lowermost part, said front surface of said wedge-shaped portion comprising means for facing the open end of said gap;

and means including said previously recited components, for generating a horizontal magnetic field, in response to the flow of time-varying electric current through said coil, for exerting a magnetic confining pressure on said pool of molten metal at the open end of said gap;

said first part of the confining coil having a front surface comprising said front surfaces of (1) the central conductor portion and (2) the wedge-shaped conductor portions.

29. A strip casting process comprising the steps of:

providing a pair of horizontally disposed, counter-rotating casting rolls (a) having a gap therebetween with an open end and (b) having facing casting surfaces converging downwardly toward a nip between the rolls;

containing a pool of molten metal in said gap, said pool having a predetermined maximum height, a relatively wide top part and a relatively narrow lowermost part at said nip;

casting said molten metal into a strip as the metal in said pool descends toward said nip;

providing an electromagnetic dam comprising a vertically disposed confining coil having a front surface with upper and lower parts;

positioning said front surface of the confining coil adjacent said open end of the gap (i) with said upper part of the front surface located opposite said wide top part of the molten metal pool, when the pool is at its predetermined maximum height, and (ii) with said lower part to the front surface located opposite said narrow, lowermost part of the pool;

flowing a current, having a first pre-selected amperage, through that part of the front surface of the confining coil opposite the wide top part of the molten metal pool, to confine that part of the pool;

and flowing a current having a second pre-selected amperage, substantially less than said first pre-selected amperage, through that part of the front surface of the confining coil opposite the narrow lowermost part of the molten metal pool, to confine that part of the pool.

5,487,422

MOUNTING BRACKET FOR A HEAT EXCHANGER

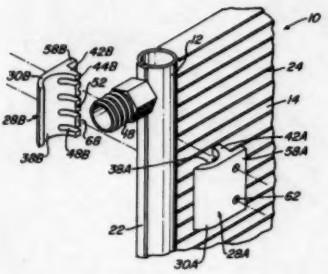
John T. Bertva, Colleyville; Scott L. Hutto, and John M. McCrady, both of Burleson, all of Tex., assignors to Wynns Climate Systems, Inc., Fort Worth, Tex.

Filed Jan. 25, 1994, Ser. No. 186,290

Int. Cl.[6] **F28F** *9/00*

U.S. Cl. 165—67 **13 Claims**

1. In a heat exchanger having a forward side and rearward side, a pair of oppositely disposed headers, each header having an



exterior wall, a plurality of substantially flat parallel flow tubes disposed between the headers for providing fluid communication between the headers, the flow tubes having opposite side edges located on the forward and rearward sides of the heat exchanger, at least one mounting bracket, comprising:

forward and rearward bracket members, each bracket member having a header engagement portion and a tube engagement portion, the header engagement portion having an inner wall which fits flush around a portion of the exterior wall of one of the headers, the tube engagement portion of the forward bracket member extending rearward and the tube engagement portion of the rearward bracket member extending forward, each tube engagement portion terminating in an inner face, and each tube engagement portion having at least one slot which extends from the inner face and which is parallel to the flow tubes for receiving one of the side edges of the flow tubes;

a mounting flange which is joined to at least one of the bracket members; and

fastening means for fastening the bracket members together with the forward bracket member located on the forward side of the heat exchanger, the rearward bracket member located on the rearward side of the heat exchanger, with said one of the headers gripped by the header engagement portions, and with one of the flow tubes located in the slot; and wherein

the inner face of one of the tube engagement portions has a protruding locator pin, the other of the inner faces having a recess which receives the locator pin when the bracket members are fastened together.

5,487,423

HEAT EXCHANGER

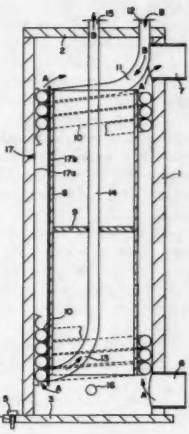
Francis Romero, Angers Cedex, France, assignor to Piscine Service Anjou SA, France

Continuation of Ser. No. 17,746, Feb. 16, 1993, abandoned. This application Dec. 5, 1994, Ser. No. 349,472

Int. Cl.[6] F28D *7/10*

U.S. Cl. 165—156 **3 Claims**

1. A heat exchanger for reheating a secondary fluid such as a pool of fresh or sea water, said exchanger comprising a hollow cylindrical body (**1**) having an inlet for receiving said secondary fluid to be reheated and an outlet for discharging said reheated fluid, a sleeve (**8**) co-axially located inside the body and spaced from an inside wall of said body and forming an annular space there between, a coiled tube (**10**) in which the primary fluid circulates and which is located inside and co-axially with said annular space, an intake (**12**) and an output (**15**) for said coiled tube **10**, one end of said coiled tube being coupled directly to one of said intake and said output, an opposite end of said coiled tube being coupled to the other of said intake and said output via a pipe extending through a center of said coiled tube, the secondary fluid passing through said annular space and over said coiled tube, the body (**1**) and the sleeve (**8**) being made of a reinforced polyester plastic-based material, the coiled tube (**10**) being made of titanium, a first spacer (**17***a*) between the inside wall of the body (**1**) and the coiled tube (**10**), said first spacer being a strip provided with a series of recesses for individually receiving and supporting each turn of the coiled tube (**10**), and a second spacer (**17***b*) between the outside wall of the sleeve (**8**) and the coiled tube (**10**), said second spacer being a strip pushing said individual turns against said supporting shapes in said first spacer.



2. A heat exchanger for reheating a secondary fluid such as a pool of fresh or sea water, said exchanger comprising a hollow cylindrical body (**1**) having an inlet for receiving said secondary fluid to be reheated and an outlet for discharging said reheated fluid, a sleeve (**8**) co-axially located inside the body and spaced from said body and forming an annular space therebetween, the body (**1**) and the sleeve (**8**) being made of a reinforced polyester plastic-based material, a coiled tube (**10**) in which the primary fluid circulates and which is located inside said annular space, the secondary fluid passing through said annular space and over said coiled tube, the coiled tube (**10**) being made of titanium, a first spacer (**17***a*) between an inside wall of the body (**1**) and the coiled tube (**10**), said first spacer being an undulating strip provided with a series of arcuate recesses for individually receiving and supporting each turn of the coiled tube (**10**), and a second spacer (**17***b*) between the outside wall of the sleeve (**8**) and the coiled tube (**10**), said second spacer being a strip which is smooth on opposite sides for pushing said individual turns against said supporting shapes in said first spacer whereby said coil is installed and locked in space by the sliding of said second spacer into an area between said outside wall of the sleeve and said coiled tube for locking said individual turns in said arcuate recesses.

5,487,424

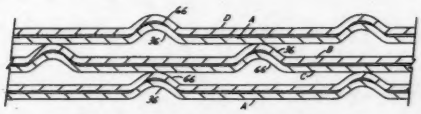
DOUBLE-WALL WELDED PLATE HEAT EXCHANGER

Roger C. Davison, Wichita Falls, Tex., assignor to Tranter, Inc., Augusta, Ga.

Continuation-in-part of Ser. No. 76,110, Jun. 14, 1993. This application Aug. 5, 1994, Ser. No. 286,536

Int. Cl.[6] F28F *3/08*

U.S. Cl. 165—166 **5 Claims**



5. A plate heat exchanger comprising:

a first set of plate assemblies,

a second set of plate assemblies,

the plate assemblies of the first set being arranged alternately with the plate assemblies of the second set in a stacked,

parallel relationship such that the plate assemblies of the first and second sets are respectively interleaved with one another,

each plate assembly of said first set comprising a first plate and a second plate, said first and second plates of each plate assembly of said first set having parallel, generally planar main body portions defining a space therebetween for the flow of a first fluid,

each plate assembly of said second set comprising a third plate and a fourth plate, said third and fourth plates of each plate assembly of said second set having parallel, generally planar main body portions defining a space therebetween for the flow of a second fluid,

the main body portion of the first plate of each plate assembly of the first set having a plurality of spaced-apart raised dimples projecting away from the main body portion of the second plate thereof, the main body portion of the second plate of each plate assembly of the first set having a plurality of spaced-apart raised dimples projecting toward the main body portion of the first plate thereof but in offset relation thereto to establish the aforesaid space therebetween for the flow of the first fluid,

the dimples of the first and fourth plates of the interleaved plate assemblies nesting with one another to define minimum spacing therebetween and provide venting for possible leaks,

the main body portion of the third plate of each plate assembly of the second set having a plurality of spaced-apart raised dimples projecting away from the main body portion of the fourth plate thereof, the main body portion of the fourth plate of each plate assembly of the second set having a plurality of spaced-apart raised dimples projecting toward the main body portion of the third plate thereof but in offset relation thereto to establish the aforesaid space therebetween for the flow of the second fluid,

the dimples of the second and third plates of the interleaved plate assemblies nesting with one another to define minimum spacing therebetween and provide venting for possible leaks.

5,487,425

COMPOSITION AND METHOD FOR RECOVERY OF PETROLEUM AND GAS

Takamasa Ohno, Musashino; Keietsu Kato, Chiba; Yoshiyuki Yamaguchi, Tokyo; Masami Murakami, Akishima, all of, Japan; Shogo Suzuki, Calgary, Canada; Shoichi Kanda, and Tsuyoshi Nakagawa, both of Yokohama, Japan, assignors to Nitto Chemical Industry Co., Ltd., and Japan Petroleum Exploration Co., Ltd., both of Tokyo, Japan

Filed Sep. 22, 1994, Ser. No. 310,486

Claims priority, application Japan, Sep. 24, 1993, 5-238173

Int. Cl.[6] C09K *7/02*

U.S. Cl. 166—295 **6 Claims**

1. A composition for recovery of petroleum and gas, which comprises:

(a) a copolymer having a molecular weight of 100,000 or more, consisting of 30–75 mole % of N-vinylpyrrolidone unit, 5–65 mole % of (meth)acrylamide unit and 5–20 mole % of (meth-)acrylic acid unit or a salt thereof,

(b) a water-soluble aldehyde,

(c) a phenol compound, and

(d) water.

5,487,426

ROD GUIDE WITH REMOVABLE VANES

Dan E. O'Hair, Conroe, Tex., assignor to Enterra Patco Oilfield Products Inc., Houston, Tex.

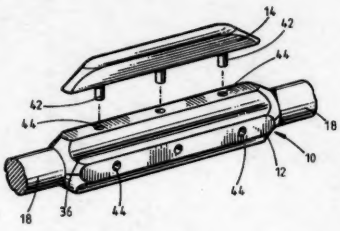
Filed Sep. 23, 1994, Ser. No. 311,496

Int. Cl.[6] F21B *17/10*

U.S. Cl. 166—378 **12 Claims**

12. A method of forming a rod guide comprising the steps of:

a. molding a body to a sucker rod segment, the body adapted to receive a plurality of vanes;



b. separately molding a plurality vanes; and

c. detachably anchoring the vanes directly to the body such that the vanes remain stationary in relation to the body while the vanes are anchored to the body.

5,487,427

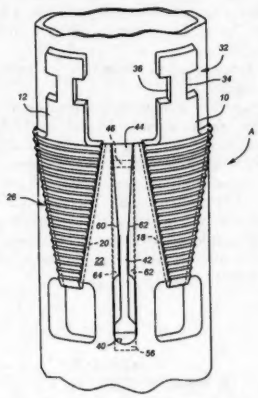
SLIP RELEASE MECHANISM

Alfred R. Curington, The Woodlands, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Apr. 6, 1994, Ser. No. 223,597

Int. Cl.[6] E21B *23/00;23/06;33/129*

U.S. Cl. 166—382 **20 Claims**



1. An apparatus for activating a slip for downhole use comprising:

at least one slip;

an annularly shaped slip support member having a longitudinal axis, said slip movably mounted to said slip support member for selective movement toward and away from said longitudinal axis of said slip support member; and

a weakening assembly retained by said slip support member and selectively movable with respect to said slip support member while remaining retained thereby to facilitate retraction of said slip toward said longitudinal axis of said slip support member.

10. A method of releasing a slip from a set position where it is wedged between a support member and a casing or liner, comprising:

providing a weakening assembly retained by the support member;

moving the weakening assembly with respect to the support member while continuing to retain said weakening assembly thereto;

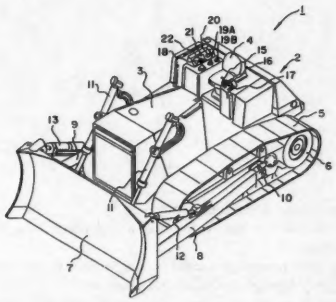
weakening a wall in said support member by said moving; and

retracting the slip from the casing or wellbore.

5,487,428
STRAIGHT-AHEAD TRAVELING CONTROL SYSTEM FOR A BULLDOZER

Shigeru Yamamoto; Shigenori Matsushita; Shu huai Zhang; Satoru Nishita, and Kazushi Nakata, all of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 23, 1994, Ser. No. 264,348
Claims priority, application Japan, Jun. 23, 1993, 5-152406
Int. Cl.[6] A01B *63/111;* **E02F** *3/76*
U.S. Cl. 172—4.5 **13 Claims**



1. A straight-ahead traveling control system for a bulldozer comprising:

(a) driving mode setting means which can set an automatic blade control mode for dozing operation;

(b) yaw angle detector means for detecting a yaw angle of a vehicle body in relation to a target traveling direction for the vehicle body;

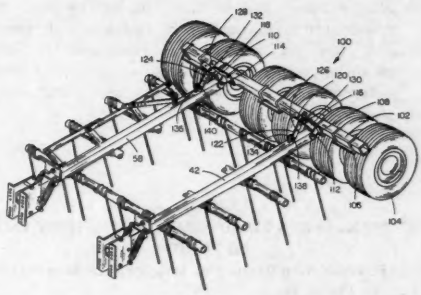
(c) blade tilt angle detector means for detecting a tilt angle of a blade tilting laterally in relation to the ground; and

(d) blade controller means for controlling tilting of the blade based on a final tilting amount obtained by adding a first blade tilting amount used for driving the vehicle body straight ahead to a second blade tilting amount used for forming a laterally horizontal earth surface after digging by the blade, the first blade tilting amount being obtained from the yaw angle of the vehicle body detected by the yaw angle detector means and the second blade tilting amount being obtained from the tilt angle of the blade detected by the blade tilt angle detector means, when the driving mode setting means has set the automatic blade control mode.

5,487,429
SPRING TOOTH HARROW PACKER

Michael B. Gates, R.R. 1, Box 60, Lansford, N. Dak. 58750

Continuation-in-part of Ser. No. 16,791, Feb. 11, 1993, Pat. No. 5,358,056, which is a continuation-in-part of Ser. No. 725,342, Jul. 3, 1991, abandoned. This application Sep. 9, 1994, Ser. No. 303,778
Int. Cl.[6] A01B *49/02;5/04*
U.S. Cl. 172—175 **6 Claims**



1. A spring tooth harrow packer, comprising:

an elongated, horizontally disposed and transversely extending draw bar having rearward and forward sides;

said draw bar being wheel supported and having a hitch extending forwardly therefrom for attachment to a tractor;

a plurality of harrow sections operatively secured to said draw bar and being positioned rearwardly thereof; said harrow sections including a plurality of ground engaging spring teeth;

each of said harrow sections being pivotally secured, about a horizontal axis, to said draw bar:

and a packer assembly mounted on the rearward end of each of said harrow sections;

said packer assembly including a plurality of rotatable packer elements;

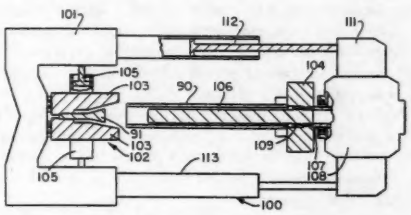
said packer assembly including a transversely extending support bar which is secured to the rearward end of the associated harrow section;

and adjustment means for selectively vertically moving said packer assembly with respect to the associated harrow section for selectively controlling the penetration depth of at least the teeth at the rearward end of the associated harrow section and wherein said adjustment means permits said packer assembly to be raised out of ground engagement to enable the spring tooth harrow packer to only harrow.

5,487,430
PNEUMATIC GROUND-PIERCING TOOL AND BODY THEREFOR

Steven W. Wentworth, Greenfield; Robert F. Crane, Mequon, and Jon A. Haas, Oconomowoc, all of Wis., assignors to Earth Tool Corporation, Oconomowoc, Wis.

Division of Ser. No. 591,099, Oct. 1, 1990, Pat. No. 5,199,151, which is a continuation-in-part of Ser. No. 435,953, Nov. 13, 1989, Pat. No. 5,025,868. This application May 5, 1992, Ser. No. 878,741
Int. Cl.[6] E21B *11/02*
U.S. Cl. 173—91 **14 Claims**



1. A tool body for use in a pneumatic ground-piercing tool, which body comprises a metal tube having a tapered front end portion, and an anvil having a frustoconical rear portion which seats against the inner surface of the front end portion and a cylindrical shank which extends out of a front end opening of the metal tube, made by the method which comprises:

forcing a front end portion of a metal tube between spaced, frustoconical surfaces of a forming anvil and a die to form the end portion into a frustoconically tapered shape on both the inner and outer surfaces thereof, the forming anvil having a frustoconical rear portion which seats against the inner surface of the front end portion and a cylindrical shank which extends out of the front end opening of the metal tube, whereby the inner surface of the front end opening of the tube has the same diameter as the cylindrical shank of the forming anvil;

removing the forming anvil from the tube; and

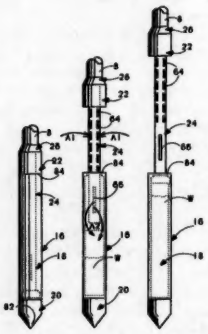
installing a different anvil in place of the forming anvil, which different anvil has substantially the same shape as the forming anvil, except that a portion of the different anvil has a diameter slightly greater than the corresponding similarly shaped portion of the forming anvil so that the different anvil is interference-fitted in the body.

5,487,431

SUBTERRANEAN FLUID SAMPLING SYSTEMS AND METHODS

David E. Webb, Vero Beach, Fla., assignor to Drilling Services, Inc., Ft. Pierce, Fla.

Filed Jun. 20, 1994, Ser. No. 262,688
Int. Cl.[6] E21B *7/26*
U.S. Cl. 175—20 **2 Claims**



1. In a subterranean sampling system of the direct push type comprising an elongated push tube having a tool connector lower end and hydraulic means to force said push tube downwardly through subterranean strata, an improved sampler unit connected to said lower end which comprises:

a cylinder defining a fluid sample retention space, said cylinder comprising a first end portion and a second end portion,

a pierce member defined by a pointed distal end portion and a proximal end portion in fluid tight connection with said first end portion of said cylinder,

guide means comprising a first end inlet terminus through which a central bore extends, a second end fluid tight connection with said cylinder second end portion and a longitudinal conduit extending from said central bore to said second end fluid tight connection,

an elongated tube defined by an external wall, an internal wall, a closed end part, an open end part and a longitudinal body part joining said closed end part to said open end part, said body part having a plurality of spaced apart slots extending radially through said external and internal walls,

said elongated tube being slideably received in said central bore of said guide means to prevent fluid passage between said external wall and said central bore, and

means providing a fluid tight connection between said push tube and said open end part of said elongated tube, but unconnected to said guide means or said cylinder whereby said elongated tube may first be moved partially out of said cylinder to position less than all of said plurality of spaced apart slots outside said cylinder thereby permitting and thereafter positioning all of said spaced apart slots outside said cylinder thereby preventing fluid to flow from said strata into said cylinder.

5,487,432

SUBSURFACE TOOL

Jon E. Thompson, 30 White Hills, NE., Grand Rapids, Mich. 49546

Filed Feb. 22, 1995, Ser. No. 392,096
Int. Cl.[6] E21B *49/02*
U.S. Cl. 175—20 **6 Claims**

2. A soil penetrating tool comprising:

a shaft having an upper end and a soil penetrating lower end element;

a transverse elongated handle having a pair of ends for manual gripping thereof, and a central zone; and

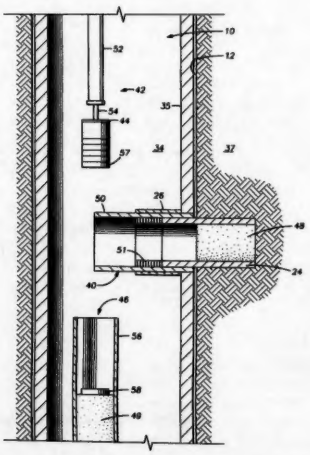
an isolator coupling between said shaft and said handle, said coupling being an electrically insulating element having an upper end secured to said handle central zone, and having a lower end secured to said shaft upper end.

5,487,433

CORE SEPARATOR ASSEMBLY

Bruce W. Mackay, Sugar Land, and Abbas Arian, Houston, both of Tex., assignors to Westers Atlas International Inc., Houston, Tex.

Filed Jan. 17, 1995, Ser. No. 373,654
Int. Cl.[6] E21B *25/02*
U.S. Cl. 175—78 **4 Claims**



1. A core collector mounted on a coring tool for use in a borehole, comprising in combination:

a hollow core cutting bit having a borehole sidewall core-cutting position and a core-storage position;

a core ejector means;

means for causing said core ejector means sequentially

1) to execute an ejecting stroke to eject a core from said core cutting bit into a core storage means when said core cutting bit is disposed in the core-storage position and

2) to positively deposit a core separator ring on top of the ejected core prior to executing a withdrawal stroke.

5,487,434

ROCK DRILL WITH CONVEYING GROOVE

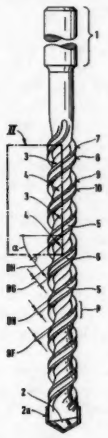
Josef Obermeier, Peiting, Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Nov. 14, 1994, Ser. No. 338,066

Claims priority, application Germany, Nov. 12, 1993, 43 38 667.9

Int. Cl.[6] F21B *10/44*

U.S. Cl. 175—323 **6 Claims**



1. A rock drill has an axially elongated shank with an axially extending outside surface and a central axis, said shank has an axially extending chucking shank section (**1**) at one end thereof and a drilling tip (**2**) at an opposite end thereof, helically shaped conveying first grooves are formed in said outside surface and extend from adjacent said drilling tip towards said chucking shank section (**1**), helically shaped lands (R) are located between said conveying first grooves and extend from adjacent said drilling tip towards said chucking shank section, said lands (R) form said outside surface and have a helically-shaped auxiliary second groove (**5**, **6**) positioned between a pair of helically-shaped guidance regions (**7**, **8**, **9**, **10**) adjoining said first grooves, said first grooves and said lands having an angle of inclination relative to the central axis, wherein the improvement comprises that said conveying first grooves have a width (BH) measured perpendicularly to the angle of inclination, said lands comprising said guidance regions (**7**, **8**, **9**, **10**) and said second grooves (**5**, **6**) have a width (BG) measured perpendicularly to the angle of inclination, and the width (BH) of said first grooves is in a ratio in the range of 1.4 to 2.5 times to the width (BG) of said lands.

5,487,435

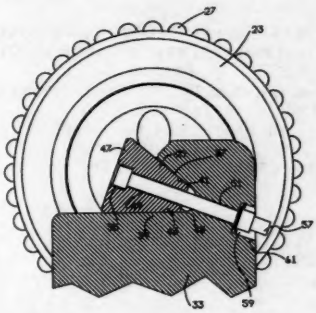
MOUNTING SYSTEM FOR RAISE AND SHAFT CUTTERS

Dolph R. Crawley, Arlington, and Steven R. Brooke, Mansfield, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Jul. 7, 1994, Ser. No. 271,710

Int. Cl.[6] F21B *10/12*

U.S. Cl. 175—363 **9 Claims**



1. A mounting system to secure raise or shaft cutters to a bit body, comprising:

a mount adapted for connection to the bit body and having at least one leg that extends at an acute angle to the rotational axis of the bit body;

a journal having one wedge shape end adapted to be secured to a wedge shape opening in the leg;

an earth disintegrating cutter rotatably secured to the journal;

the wedge on the journal having a fastener hole to register coaxially with a fastener hole in the leg and being adapted to receive a fastener to secure the wedge on the journal in the wedge shape in the leg;

one side of the wedge shape being generally perpendicular to the rotational axis of the bit body, the adjacent side forming an acute angle with the perpendicular side.

5,487,436

CUTTER ASSEMBLIES FOR ROTARY DRILL BITS

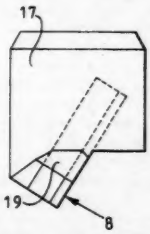
Nigel D. Griffin, Whitminster, England, assignor to Camco Drilling Group Limited, Stonehouse, England

Filed Jan. 18, 1994, Ser. No. 183,048

Claims priority, application United Kingdom, Jan. 21, 1993, 9301146

Int. Cl.[6] E21B *10/46*

U.S. Cl. 175—432 **11 Claims**



1. A cutter assembly for a rotary drill bit comprising a preformed polycrystalline diamond cutting element at least partly embedded in a solid post, the cutting element comprising a layer of polycrystalline diamond bonded to a substrate of a material less hard than the polycrystalline diamond and being a non-thermally stable cutting element of a kind which begins to suffer significant thermal

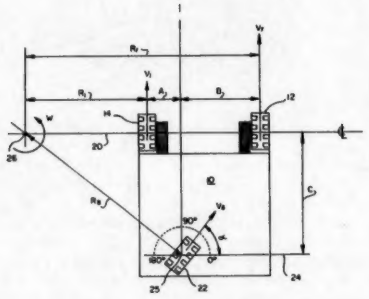
degradation at a temperature which is less than about 1000° C., and said solid post being formed from solid infiltrated matrix material comprising a body of particles of a powdered material which is less hard than the polycrystalline diamond, the particles having been bonded together by infiltration into the body of particles of a molten metal alloy which has subsequently solidified.

5,487,437

COUPLED DIFFERENTIAL TURNING CONTROL SYSTEM FOR ELECTRIC VEHICLE TRACTION MOTORS

Isaac Avitan, c/o Schaeff Inc., P.O. Box 9700, Sioux City, Iowa 51102-9700

Filed Mar. 7, 1994, Ser. No. 207,299
Int. Cl.[6] B62D *11/02*
U.S. Cl. 180—6.5 **21 Claims**



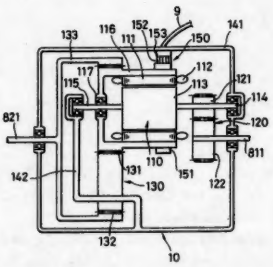
1. A turning control system for an electric vehicle which traverses a support surface along a direction of travel, the vehicle having a left traction motor and a right traction motor, a left motor drive control circuit for controlling the operation of the left traction motor and a right motor drive control circuit for controlling the operation of the right traction motor, means drivingly coupling each traction motor with traction means for engaging and propelling the vehicle over a support surface, the traction means being laterally spaced from one another relative to the direction of travel of the vehicle, the turning control system comprising means for generating a signal representative of a desired vehicle steer angle, means receiving the desired vehicle steer angle signal and in response thereto, generating a left reference signal and a right reference signal, each reference signal being representative of the required speed and direction of the respective left and right traction motor for effecting a vehicle turn at the desired steer angle, the turning control system further including motor coupling means, the motor coupling means including means for receiving a signal representative of the instantaneous speed of the left traction motor, for receiving a signal representative of the instantaneous speed of the right traction motor and for receiving the reference signals and in response thereto, generating a signal representative of speed lag of the left traction motor and generating a signal representative of speed lag of the right traction motor, means for modifying the left reference signal as a function of the signal representative of the speed lag of the right traction motor to generate a left motor coupled control signal and means for modifying the right reference signal as a function of the signal representative of the speed lag of the left traction motor to generate a right motor coupled control signal, the turning control system further including means for applying the left motor coupled control signal to the left motor drive control circuit and means for applying the right motor coupled control signal to the right motor drive control circuit, whereby effective speed control is provided for each traction motor which compensates for speed lag in the respective opposite motor to avoid oversteering and understeering and to provide slip free engagement between the traction means and the support surface.

5,487,438

DRIVING SYSTEM FOR AN ELECTRIC VEHICLE

Shigenori Kinoshita, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Sep. 9, 1993, Ser. No. 118,309
Claims priority, application Japan, Sep. 11, 1992, 4-269369
Int. Cl.[6] B60K *1/00*
U.S. Cl. 180—65.1 **12 Claims**



1. A driving system for an electric vehicle, the electric vehicle including a left-hand wheel, a right-hand wheel and an AC motor having a primary side and a secondary side, said primary side receiving power from a battery used as a power source, said driving system comprising;

a motor frame;

supporting means for rotatably separately supporting the primary side of said AC motor and the secondary side of said AC motor relative to said motor frame for rotation about a first axis;

a first power transmission shaft for driving one of said left-hand and right-hand wheels;

means for reversibly operatively connecting one of the primary side and the secondary side of said AC motor to said first power transmission shaft;

a second power transmission shaft for driving the other one of said left-hand and right-hand wheels;

means, comprising an external gear and an internal gear meshing with said external gear, for non-reversibly operatively connecting the other of the primary side and the secondary side of said AC motor to said second power transmission shaft; and

means for feeding electricity from said battery to the primary side of said AC motor;

wherein, said first and second power transmission shafts are coaxially supported on a second axis relative to said motor frame, and said second axis is offset from and parallel to said first axis.

5,487,439

REAR WHEEL STEERING DEVICE

Katsukuni Kabuto, Inuyama, and Joji Otsuka, Kani, both of, Japan, assignors to Kayaba Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 875,043, Apr. 28, 1992, abandoned. This application Feb. 7, 1994, Ser. No. 192,387
Int. Cl.[6] F16K *31/52*
U.S. Cl. 180—79.1 **6 Claims**

1. A wheel steering device comprising

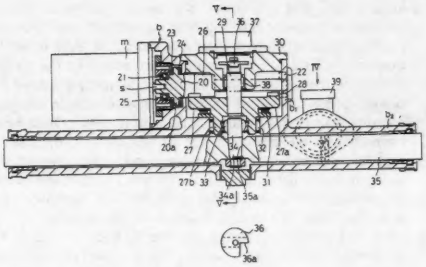
a drive motor having an output,

a rotatably mounted gear wheel having an input side, an output side and a vertical axis of rotation,

a spherical bearing mounted on the gear wheel at the output side of said gear wheel, the spherical bearing having a center axis offset from the gear wheel axis of rotation,

a rod disposed proximal the output side of the gear wheel at a location below a location at which the spherical bearing is carried at said gear wheel output side,

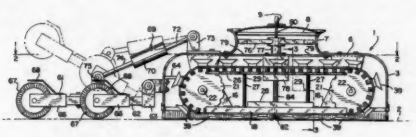
a stud shaft having an upper end part and a lower tapered end part, the stud shaft upper end part being received in said spherical bearing with a stud shaft axis coaxial with the



spherical beating axis, the stud shaft lower tapered end part being received fixed in a companionly configured tapered bore in the rod, and

means drivingly coupling the drive motor output with the input side of said gear wheel thereby to rotate the gear wheel, the spherical bearing being drivingly connected with the gear wheel output side so that on rotation of said gear wheel drive is transmitted from the stud shaft to the rod to rotate said rod about a rod longitudinal axis and to slide it in a rod axial direction.

5,487,440
ROBOTIC APPARATUS
Henry R. Seemann, 2420 N. 202 Pl., Seattle, Wash. 98133
Filed May 18, 1993, Ser. No. 63,464
Int. Cl.[6] B62D *55/265*
U.S. Cl. 180—164 **28 Claims**



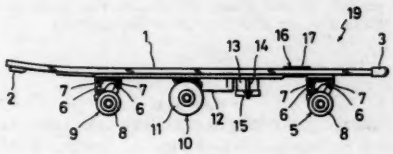
1. A robotic apparatus for traversing a surface, comprising a supporting structure, a pair of parallel tracks, an endless member mounted for travel on each track, drive means for driving each endless member in a path of travel, each track including a first recess and a second recess, said recesses disposed in side-by-side laterally spaced relation, said recesses each having an open side facing the respective endless member, a plurality of vacuum cups mounted on each endless member, first port means providing communication between said first recess of each track and a first group of vacuum cups, second port means providing communication between the second recess of each track and a second group of said vacuum cups, and vacuum means for creating a negative pressure in each recess.

5,487,441
MOTORIZED BOARD WITH PRESSURE ACTUATED POWER SWITCH
Sadao Endo; Yoshito Tokinaga, and Kazuo Sasaki, all of Tokyo, Japan, assignors to Unitec Corporation, Tokyo, Japan
Filed May 14, 1993, Ser. No. 61,884
Claims priority, application Japan, Feb. 13, 1993, 5-047493
Int. Cl.[6] A63C *3/00*
U.S. Cl. 180—181 **1 Claim**

1. A motorized board with pressure actuated power switch comprising:

a board for supportingly receiving a player's foot;

wheels mounted to front and rear locations of a bottom surface of the board;



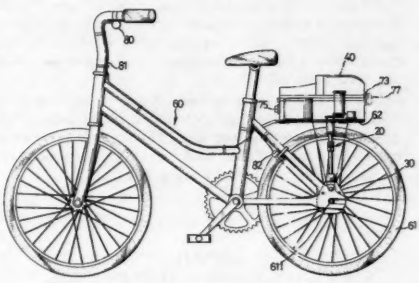
a driving wheel propelled by a geared motor and mounted to the bottom surface of the board;

a battery mounted to the board for energizing the geared motor for the driving wheel;

a switch unit carried on an upper surface of the board and operable responsive to a player foot pressure imposed thereon for turning on the geared motor, the switch unit being in off condition in an absence of said foot pressure imposition; and

said switch unit including a pressure switch for circuit connecting the battery with the geared motor, and an isolator switch intervening circuit connection of the pressure switch with one of the battery and the geared motor.

5,487,442
TRANSMISSION APPARATUS OF A ELECTRICAL BICYCLE
Jung-Lin Hua, 11th Fl., No. 1, Lane 1, Kuo Feng St., Tso Ying Dist., Kaohsiung City, Taiwan, Prov. of China
Filed Oct. 5, 1994, Ser. No. 318,131
Int. Cl.[6] B62K *11/10*
U.S. Cl. 180—220 **3 Claims**



1. A transmission apparatus of an electrical bicycle which includes a battery, a power switch, a carrie · board, a rear wheel, and a hub of the rear wheel, comprising

an upper transmission set including a speed-reducing motor connected to a drive gear which is meshed to a driven gear which has a hexagonal shaft extending downward therefrom;

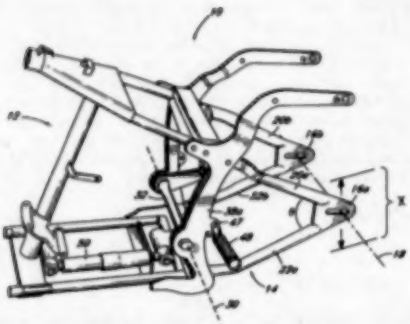
a middle transmission set comprising an upper rod, a lower rod, and a universal joint connected therebetween, the upper rod at a top thereof including a tubular head which defines a hexagonal hole for receiving the hexagonal shaft thus connecting the upper rod to the driven gear;

a lower transmission set comprising a first bevel gear extended from the lowered rod, a second bevel gear meshing with the first bevel gear, a tube extended from the second bevel gear and received in the hub of the rear wheel, at least one unidirectional needle bearing positioned between the hub and the extended tube allowing the extended tube to drive the hub to rotate thus moving the rear wheel forward yet not allowing the hub to drive the extended tube to rotate;

whereby when the power switch is turned on, the speed-reducing motor is energized to rotate, thus driving the rear wheel to move forward via transmission through the drive gear, the driven gear, the upper rod, the universal joint, the lower rod, the first bevel gear, the second bevel gear, the extended tube, the unidirectional bearing, and the hub, while when the power switch is turned off and the electrical bicycle is physically

pedaled, the hub rotates to drive the rear wheel to move forward yet not drive the transmission apparatus.

5,487,443
MOTORCYCLE TORSION SUSPENSION SYSTEM
Kenneth R. Thurm, 2348 Rockridge Cir., Orange, Calif. 92667
Filed Jan. 18, 1994, Ser. No. 183,604
Int. Cl.[6] B62K *25/12*
U.S. Cl. 180—227 **19 Claims**

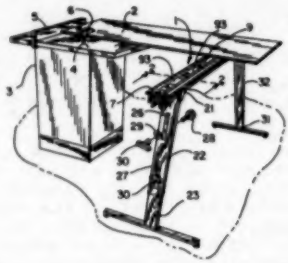


1. A suspension system for a motorcycle, comprising:
a frame;
a swing arm pivotally mounted to said frame on a pivot axis, said swing arm having a pair of wheel mounts located on a wheel axis spaced to receive a wheel, a pair of arms extending from each of said wheel mounts, a connector connecting each said pair of arms, each connector being joined to the other connector by an upper transverse cross member and a lower transverse cross member; and
a torsion bar extending along said pivot axis, said torsion bar being rigidly connected at a first end to said frame and being connected at a second end to said swing arm wherein said frame substantially covers said connectors and said torsion bar from a side view of said motorcycle.

5,487,444
SHOCK-ABSORBING SAFETY HARNESS
Mark Dennington, P.O. Box 2447, Kenai, Ak. 99611-2447
Filed Mar. 23, 1993, Ser. No. 35,459
Int. Cl.[6] A62B *35/00*
U.S. Cl. 182—6 **13 Claims**

1. A safety harness for suspending a person wearing the harness from a single safety lanyard, comprising:
a harness securable to a person's torso and having an anterior side and a posterior side and defining left and right sides;
a resilient harness support assembly having at least three end branches, a first end branch being connected to the harness proximate the left anterior side of the harness, a second end branch being connected to the harness proximate the right anterior side of the harness, and a third end branch being connected to the posterior side of the harness, the harness support assembly further having an intermediate portion disposed between the third end branch and the first and second end branches, at least a portion of the resilient harness support assembly being constructed from a resilient material;
a lanyard coupling coupled to the intermediate portion of the resilient harness support assembly and disposed centrally relative to the left and right sides of the harness for connection to the single safety lanyard whereby the harness and the single safety lanyard support the person's weight and position the person in a vertically and laterally upright disposition when the person is suspended from the single safety lanyard, the resilient harness support assembly being reversibly deformable to absorb impact loads imposed on the safety lanyard and the harness and a fail-safe lanyard connected at a first end to the harness and at a second end to the safety lanyard.

5,487,445
BALL TRANSFER RAIL FOR TABLE SAW
Roy Biehl, 6631 N. Sidney Pl., Milwaukee, Wis. 53209
Division of Ser. No. 241,685, May 12, 1994, Pat. No. 5,375,679, which is a continuation of Ser. No. 953,646, Sep. 29, 1992, abandoned. This application Sep. 14, 1994, Ser. No. 306,131
Int. Cl.[6] F16M *11/00*
U.S. Cl. 182—181 **4 Claims**



1. A ball rail assembly for controlling the movement of sheet material, said ball rail assembly comprising:
a longitudinally extending U-shaped rail member having a longitudinal axis, a base and a pair of opposite upstanding side walls forming a channel therebetween;
a ball transfer cartridge slidably received within said channel, said ball transfer cartridge including a hollow housing having an open top, an open bottom supported directly on said base and a pair of opposite shelves, each of said shelves having a dimple projecting upwardly therefrom, said housing also having a ball bearing projecting continuously through and above said open top of said housing; and
holding means on said upstanding side walls of said rail member for preventing the vertical displacement of said ball transfer cartridge within said rail member and holding said ball transfer cartridge in said channel while permitting longitudinally sliding movement of said ball transfer cartridge in said channel along said longitudinal axis; said holding means comprising a pair of flanges directed inwardly towards said housing, each of said flanges having an underside engageable with one of said dimples to provide a friction fit of said ball transfer cartridge within said rail, at least one of said flanges formed with a ledge extending outwardly, said ledge preventing con-

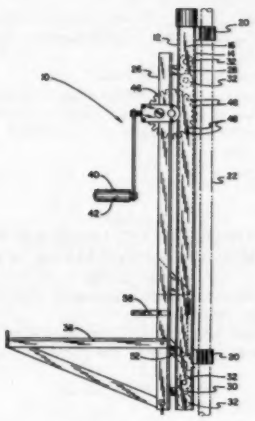
taminants from entering said channel and simultaneously directing the edge of the sheet material over said rail and onto said ball bearing.

5,487,446

APPARATUS FOR SELF-ADJUSTING THE HEIGHT OF AN OUTRIGGER ATTACHABLE TO SCAFFOLDING

Eric T. Patnode, P.O. Box 8, and Brian J. Jarvis, P.O. Box 2, both of Isle Lamotte, Vt. 05463

Filed May 9, 1994, Ser. No. 239,464
Int. Cl.[6] E04G *1/20*
U.S. Cl. 182—148 **3 Claims**



1. A new and improved apparatus for self-adjusting the height of an outrigger attachable to scaffolding comprising, in combination:

a C-channel support having a back wall and side walls with a plurality of apertures located along the length of the back wall, the exterior of the back wall having clamps for removable coupling with tubular scaffolding;

a vertically disposed angle iron positioned parallel with the support on the side there opposite from the clamps and having coupled thereto at its upper and lower ends a wheel carriage for riding within the C-channel support;

an outrigger platform extending forwardly from the angle iron and secured thereto for supporting an operator standing on the platform;

a rotatable handle secured with respect to the angle iron at an upper extent thereof for rotation by an operator, the handle having at its interior end a bevel gear and a large sprocket gear with peripheral teeth for rotation upon rotation of the handle, the teeth adapted to sequentially engage next adjacent apertures of the channel support upon rotation of the handle to effect the raising and lowering of the angle iron and platform upon rotation of the handle in either one direction;

a brake rod having an upper end pivoted to the angle iron and the lower end with a finger adapted to be positioned into a predetermined aperture on the channel support, and a lever pivotally secured to the angle iron coupled to the brake rod tending to withdraw the finger from the aperture upon the pressing of the lever; and

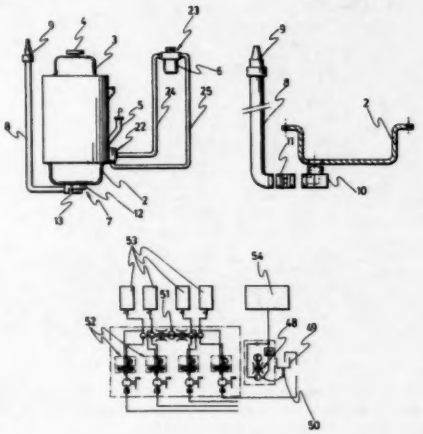
a spring coupled at its upper end to the angle iron and at its lower end to a preselected area of the brake rod tending to urge the finger into a preselected aperture for locking purposes.

5,487,447

SYSTEM FOR FACILITATING AN OIL CHANGE AND/OR AN OIL FILTER CHANGE IN INTERNAL COMBUSTION ENGINES

Manuel J. Martinez Velazquez, Uncastillo, 7, 3-A, Zaragoza, Spain

Filed May 9, 1994, Ser. No. 248,087
Claims priority, application Spain, Sep. 22, 1992, 9201887; Jan. 22, 1992, 9202109; Mar. 16, 1993, 9300552
Int. Cl.[6] F16C *3/14*
U.S. Cl. 184—1.5 **22 Claims**



1. A system for expediting a change of motor oil in internal combustion engines which include a crankcase, said system comprising:

extraction means for extracting oil frown the crankcase;

filling means for filling oil into the crankcase;

control means for controlling the operations of extraction and filling of oil;

the extraction means and filling means including:

first duct means which have a first end fixed in the proximity of the lowest point at a bottom portion of the crankcase, said first duct means having a second end which has a first connecting means;

a second remote duct means releasably connectable by a second connecting means to said first connecting means of said first duct means;

a remote unit for extraction and filling of oil, said remote unit being connected to said second duct means;

wherein the control means includes means for carrying out a controlled suction of oil from the crankcase, through said first duct means and said second duct means to said remote unit, and means for carrying out a controlled filling of the crankcase supplying oil from the remote unit through said second duct means and said first duct means;

the remote unit being connected to at least a first tank for storing oil extracted from the crankcase, the remote unit being connected to at least a second tank from which oil is supplied to the crankcase, the remote unit includes means for controlling the quantities of oil extracted from and supplied to the crankcase respectively, and

the remote unit includes means for processing and storing data relating to the quantity of oil extracted from and supplied to the crankcase, respectively; and

the first duct means comprises one single duct through which oil is pumped during extraction from the crankcase as well as during filling of the crankcase.

5,487,448

DEVICE FOR MONITORING A CONTROL UNIT

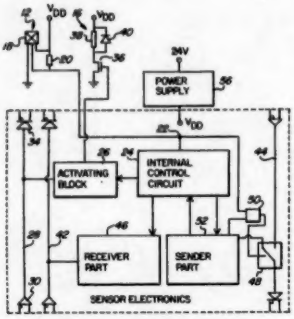
Karl-Otto Schollkopf, Esslingen; Werner Böhm, Weinstadt; Gerhard Kellings, Moers; Michael Bollerott, Essen, and Klaus Scherer, Düsseldorf, all of, Germany, assignors to Thyssen Aufzuge GmbH, Neuhausen, and Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V., Munich, both of, Germany

Continuation of Ser. No. 956,773, Feb. 11, 1993, abandoned. This application Nov. 23, 1994, Ser. No. 344,517

Claims priority, application Germany, Apr. 18, 1991, 41 12 626.2

Int. Cl.[6] B66B *5/00;13/16*

U.S. Cl. 187—247 **20 Claims**



15. An electronic switching unit for use in an electrical control system in which a plurality of such units are coupled to form a safety chain, said switching unit comprising:

a non-contacting, testable sensor;

control electronics for detecting and altering the state of said sensor;

an ascending branch terminal for coupling said unit to an ascending branch that communicates signals from a primary control of said electrical control system to a succession of said units;

a return branch terminal for coupling said unit to a return branch leading back to said primary control via said succession of units; and

an electronic changeover device for interrupting said return branch when said sensor is not in a state fulfilling a safety criterion for said safety chain.

5,487,449

MAGNETIC ELEVATOR DOOR COUPLING

David W. Barrett, East Hartland; Thomas M. McHugh, Farmington; Edward E. Ahigian, West Hartford; Jerome F. Jaminet, South Windsor; Thomas He, Unionville; Richard E. Peruggi, Glastonbury; Thomas M. Kowalcyk, Farmington, and Richard E. Kulak, Bristol, all of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Apr. 6, 1994, Ser. No. 223,898

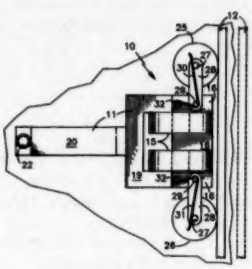
Int. Cl.[6] B66B *13/12*

U.S. Cl. 187—330 **6 Claims**

1. Apparatus for coupling an elevator hoistway door at a landing to an elevator car door so that the two may be operated in unison, comprising:

a vertical, magnetically permeable vane extending outwardly into the hoistway from a surface of a hoistway door;

a magnetic coupler disposed on an elevator car door in a position so that it is adjacent said vane whenever the elevator on which said car door is mounted is within the landing zone for the landing corresponding to said hoistway door and so that opening of the elevator car door will cause said magnetic coupler to engage said vane, the magnetic force between said magnetic coupler and said vane rigidly coupling said doors together for operation in unison;



an axle attached to said magnetic coupler and disposed in a position adjacent to and vertically displaced from said magnetic coupler;

a roller disposed on said axle; and

a spring disposed between said magnetic coupler and said axle resiliently urging said roller in a generally horizontal direction toward the door-open position of said car door.

5,487,450

BRAKING APPARATUS AND METHOD FOR A RAIL-BOUND CARRIAGE OF AN INCLINED OR VERTICAL ELEVATOR

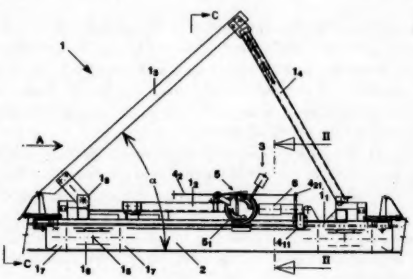
Hans Gerber, Surrey, Canada, assignor to Garaventa Holding A.G., Goldau, Switzerland

Filed Aug. 23, 1994, Ser. No. 294,651

Claims priority, application Switzerland, Aug. 24, 1993, 2510/93

Int. Cl.[6] B66B *5/04;5/12*

U.S. Cl. 187—367 **15 Claims**



1. A braking apparatus for a carriage which travels on rails of an inclined or vertical elevator, said elevator including a cable driving device having cables connected to the carriage for moving the carriage along the rails, said carriage having a main frame assembly and a movable frame assembly slidably mounted to said main frame assembly, said braking apparatus comprising:

a cam disk assembly, rotatably mounted to said movable frame assembly and having eccentric disks releasibly held in a first position at a predetermined distance away from a surface of each of said rails for frictionally engaging said rails when released from said first position;

a plurality of brake blocks, said cam disk assembly causing said brake blocks to engage frictionally said rails when said eccentric disks frictionally engage said rails;

a releasing device for causing said eccentric disks to release from said first position and engage frictionally said rails when at least one of the following occurs:

at least one of said cables breaks; and

said carriage travels above a predetermined speed; and

at least one shock absorber for damping relative movement between said movable frame assembly and said main frame assembly, when said brake blocks engage said rails, to stop movement of said carriage along said rails.

5,487,451

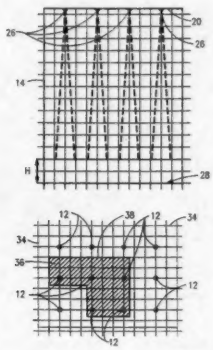
SYSTEM AND METHOD FOR DETERMINING THE AVAILABILITY OF AN ELEVATOR CAR FOR RESPONSE TO HALL CALLS

David M. Hughes, New Britain, and Gary Meguerdichian, Farmington, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Jan. 26, 1994, Ser. No. 187,669

Int. Cl.[6] B66B *3/00*

U.S. Cl. 187—392 **9 Claims**



1. A system for determining the availability of an elevator car, said system comprising:

an orthogonal array of at least twelve sensors, said orthogonal array being disposed within the elevator car, each sensor of said orthogonal array having a transmitter and a receiver and each sensor outputting a signal indicative of the presence of an object within a section of said elevator car; and

means for receiving and processing said signals from said sensors to determine a cross-sectional area of said elevator car available for oncoming passengers.

5,487,452

REVOLVING PLATE CLAMPING DEVICE

Patrice Moinard, Montreuil; Alain Thioux, Bry sur Marne, and Jean Claude Mery, Pavillons Sous Bois, all of, France, assignors to Bendix Europe Services Techniques, Drancy, France

PCT No. PCT/FR93/00233, § 371 Date May 6, 1993, § 102(e) Date May 6, 1993, PCT Pub. No. WO93/21455, PCT Pub. Date Oct. 28, 1993

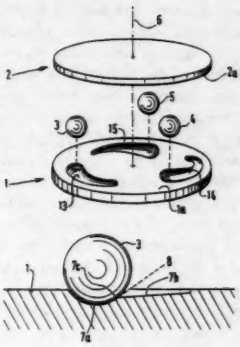
PCT Filed Mar. 10, 1993, Ser. No. 50,171

Claims priority, application France, Apr. 9, 1992, 92 04336

Int. Cl.[6] F16D *55/08*

U.S. Cl. 188—72.7 **3 Claims**

1. Clamping device consisting of two substantially parallel plates of which one at least may be driven in rotational movement about an axis perpendicular to a surface of the one plate, a plurality of guide cavities hollowed out in said one plate at a distance from the axis and a plurality of corresponding balls inserted into the cavities and gripped between the two plates, each guide cavity forming a cam and providing a bearing surface rising monotonically, covering a non-nil angle of the rotational movement, from a



portion of maximum depth to the surface of the plate, characterized in that the portion of maximum depth of the cavity forms a housing for the corresponding ball, which holds the ball in a single determined position, and in that the cavity consists in a portion of lesser depth of a ramp which intercepts the housing in a plurality of points of intersection in the direct vicinity of which the ball forms a first slope tangent with the housing and in the vicinity of which points the ramp has a second slope which is substantially shallower than the first slope, said points of intersection thus being situated on a slope discontinuity comprising an edge.

5,487,453

THERMAL PROTECTION DEVICE

Jonny Moroni, Livry Gargan, France, assignor to AlliedSignal Europe Services Techniques, Drancy, France

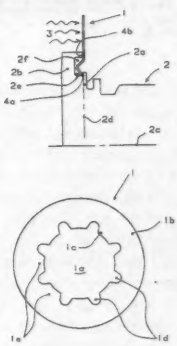
PCT No. PCT/FR93/00153, § 371 Date May 4, 1993, § 102(e) Date May 4, 1993, PCT Pub. No. WO93/21457, PCT Pub. Date Oct. 28, 1993

PCT Filed Feb. 16, 1993, Ser. No. 50,199

Claims priority, application France, Apr. 9, 1992, 92 04335

Int. Cl.[6] F16D *65/00*

U.S. Cl. 188—264 G **2 Claims**



1. A thermal protection device which can be used for protecting a disk- or drum-brake boot and composed of a support and a thermal screen, the thermal screen comprising a plate pierced through by an orifice to present an outer edge and an inner edge, the plate consisting of an elastically deformable material not subject to buckling and held in place on the support by means of at least one first bearing surface on which the plate exerts, by means of the inner edge, a force resulting from elastic deformation, said device comprising additional bearing means supplying the plate

with a second bearing surface and enabling the plate to exert on the first and second bearing surfaces forces oriented respectively in opposite directions, the inner edge of the plate cut out so as to present a plurality of tabs, the support comprising a first cylindrical portion having a circular periphery which constitutes the first bearing surface, the second bearing surface comprising at least one portion of an axial face of a second cylindrical portion of the support, contiguous with the first cylindrical portion and arranged toward the outside of the first cylindrical portion along a radial direction of the first cylindrical portion, the axial face of the second cylindrical portion of the support, except at the second bearing surface, hollowed out to provide a cavity, the plate near of the inner deformed out of a plane of the plate and along two folds of opposite concavities to form an annular flange, said flange located in the cavity without touching a bottom of the cavity, and the second bearing surface comprising at least one portion of the periphery of the axial face of said second cylindrical portion.

5,487,454

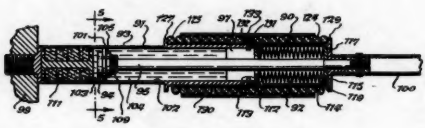
LEAKAGE BELLOWS OF HYDRAULIC DAMPER PROTECTED BY OPPOSITELY WOUND COIL SPRINGS

Alan R. Klembczyk, Cheektowaga, and John C. Metzger, East Aurora, both of N.Y., assignors to Tayco Developments, Inc., North Tonawanda, N.Y.

Filed Dec. 1, 1994, Ser. No. 347,872

Int. Cl.[6] F16F *9/04*

U.S. Cl. 188—298 **11 Claims**



1. A hydraulic damper and spring combination comprising a cylinder, a chamber in said cylinder, fluid in said chamber, an end wall in said cylinder, a seal in said end wall, a piston head in said chamber, a piston rod mounting said piston head and passing through said seal and having an external piston rod portion on the opposite side of said end wall from said chamber, a bellows, a first end on said bellows in fluid tight relationship to said end wall on the opposite side thereof from said chamber, a second end on said bellows affixed in fluid tight and encircling relationship to said external piston rod portion whereby any leakage from said chamber through said seal is received in said bellows, a first spring wound in a first direction having a first end portion encircling said cylinder and having a first outer end bearing against a portion of said cylinder, a second spring encircling said external piston rod portion and wound in a second direction which is opposite to said first direction and having a second outer end in effective bearing relationship with said external piston rod portion, and first and second inner ends on said first and second springs, respectively, effectively bearing against each other whereby said inner ends of said first and second springs will travel in the same direction as said springs expand and contract to thereby eliminate the application of torsional forces from said springs to said bellows.

5,487,455

VARIABLE FLOW VALVE WITH POSITION SENSOR

Hans-Jörg Feigel, Rosbach, Germany, assignor to ITT Automotive Europe GmbH, Germany

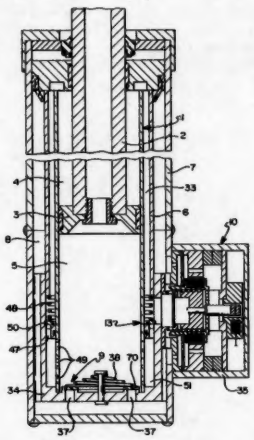
PCT No. PCT/EP93/00353, § 371 Date Aug. 24, 1994, § 102(e) Date Aug. 24, 1994, PCT Pub. No. WO93/17254, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 13, 1993, Ser. No. 295,684

Claims priority, application Germany, Feb. 29, 1992, 42 06 380.9

Int. Cl.[6] F16F *9/46;* B60G *17/08*

U.S. Cl. 188—299 **23 Claims**



1. A vibration absorber valve, comprising:

a valve body,

an electromechanical transducer for actuating said valve body,

a measuring apparatus for monitoring the actuating travel of said valve body,

an electric circuit coupled to said measuring apparatus and in such a way that in a first range of volumetric flow rate of a fluid through said valve body, a first restricting function is performed and in a second range of volumetric flow rate of a fluid through said valve body, a second restricting function is performed.

5,487,456

PRESS DRIVE WITH OIL SHEAR CLUTCH/BRAKE DRIVES WITH INTERNAL FLYWHEEL BRAKE

Gordon M. Sommer, Grosse Pointe Shores, Mich., assignor to Sommer Company, Warren, Mich.

Filed Jul. 7, 1994, Ser. No. 271,485

Int. Cl.[6] F16D *67/04*

U.S. Cl. 192—18 A **13 Claims**

1. An oil-shear clutch/brake drive comprising:

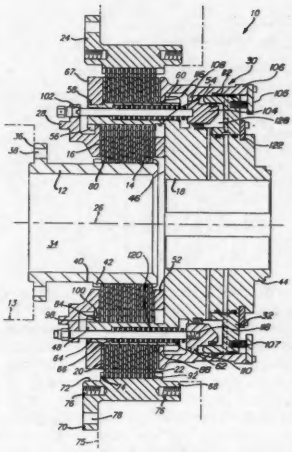
a housing;

an input member rotatably disposed with respect to said housing;

an output member rotatably disposed with respect to said housing;

a brake disposed between said housing and said output member, said brake being movable between an applied condition where said output member is locked to said housing and a released condition where said output member can rotate relative to said housing;

a clutch disposed between said input member and said output member, said clutch being movable between an engaged condition where said input member is locked to said output



member and a disengaged condition where said input member can rotate relative to said output member;

a clutch engagement member connected to said clutch to move said clutch between said engaged condition and said disengaged condition;

a brake engagement member connected to said brake to move said brake between said applied condition and said released condition, said brake engagement member being connected to said clutch engagement member;

brake biasing means for urging said brake engagement member to move said brake into said applied condition; and

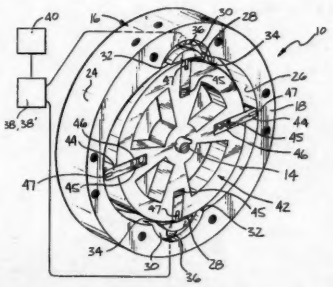
lost-motion drive means disposed between said brake engagement member and said clutch engagement member for allowing movement of said clutch engagement member totally independent of said brake biasing means and said brake engagement member.

5,487,457

PRESSURE ACTIVATED ROTARY CLUTCH

Bowdie J. Isanhart, Fort Smith, Ark., assignor to Entrepreneurial Technologies, Inc., Little Rock, Ark.

Filed Jun. 22, 1994, Ser. No. 264,158
Int. Cl.[6] F16D *31/00*
U.S. Cl. 192—58.2 **15 Claims**



1. A pressure activated rotary hydraulic clutch comprising:

a sealed unit enclosing hydraulic fluid;

said unit being mounted to and rotatable about a rotatable shaft;

said shaft defining an axial direction and having a leading end disposed in said unit;

said unit including a circumferentially extending outer wall and also a circumferentially extending inner wall;

said inner wall including at least one lobe having a major dimension and a minor dimension from said shaft;

a hydraulic fluid passageway in said unit and having an inlet in said inner wall on one side of said minor dimension and an outlet in said inner wall on another side of said minor dimension;

a flow control valve disposed in said fluid passageway for controlling hydraulic fluid flow therethrough;

a flow control valve actuator in communication with said flow control valve for operating said flow control valve;

a rotor fixed to said leading end within said inner wall and rotatable with said shaft; said rotor being in proximity with said minor dimension of said lobe;

a vane on said rotor for moving said hydraulic fluid through said fluid passageway when the passageway is open and said shaft is rotated and for driving said unit through said hydraulic fluid when said passageway is restricted; and

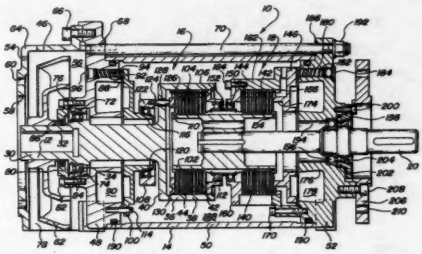
whereby said unit rotates independently of said shaft and rotor when said passageway is unrestricted and said unit rotates with said shaft and rotor when said valve is operated to restrict fluid flow through said fluid passageway.

5,487,458

ELECTRICALLY ENERGIZED OIL SHEAR DRIVE SYSTEM

Gordon M. Sommer, Grosse Pointe Farms, Mich., assignor to Midwest Brake Bond Company, Warren, Mich.

Filed Nov. 3, 1993, Ser. No. 148,197
Int. Cl.[6] F16D *67/06*
U.S. Cl. 192—18 B **12 Claims**



1. A drive system for transmitting power from a drive to an apparatus, said drive system comprising:

a stationary housing;

an output member for transmitting rotation from said drive system, said output member adapted to engage said apparatus and rotatably mounted in said housing;

an input member for transmitting rotation to said drive system, said input member adapted to engage said drive and rotatably mounted in said housing;

a selectively operable brake for prohibiting rotation of said output member with respect to said housing; said brake being capable of being positioned in an applied or a released condition;

a non-rotating brake application member including a first axially movable pressure plate for positioning said brake in said applied or said released condition;

a selectively operable clutch for locking said input member to said output member, said clutch being capable of being positioned in an engaged or disengaged condition;

a non-rotating clutch engagement member including a second axially movable pressure plate for positioning said clutch in said engaged or said disengaged condition;

a first spring member for biasing said non-rotating brake application member such that said brake is normally positioned in said applied condition; and

a second spring member for biasing said non-rotating clutch engagement member such that said clutch is normally positioned in said engaged condition.

5,487,459

COLLECTION AND ISSUING APPARATUS FOR ROUND PARKING CARDS

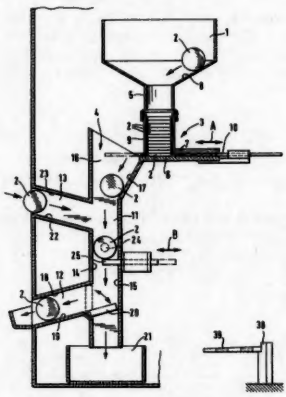
Johann Farmont, Dusseldorf, Germany, assignor to Farmont Tecknik GmbH & Co. KG, Germany

Continuation-in-part of Ser. No. 84,545, Jun. 29, 1993, abandoned. This application Feb. 15, 1994, Ser. No. 196,648

Claims priority, application Germany, Feb. 20, 1993, 9302481 U; Jan. 13, 1994, 44 00 744.2

Int. Cl.[6] **G07F** *7/02;* **G07B** *15/00*

U.S. Cl. 194—213 **14 Claims**



1. A parking system comprising:

round parking cards, each having unique attributes; and a collection and issuing apparatus including:

a supply container for holding the parking cards, said container having a base;

a separation device located at the base for issuing the parking cards to at least one guiding chute, the guiding chute having at least first and second side chutes which branch off from the guiding chute at respective inclinations and which are provided for issuing and collecting the parking cards in a rolling manner under the force of gravity, respectively; and

a measuring point being located in the guiding chute for reading the unique attributes of issued and collected parking cards, the measuring point being connected to a control means for actuating a parking barrier.

5,487,460

SHORT STRAND ORIENTER

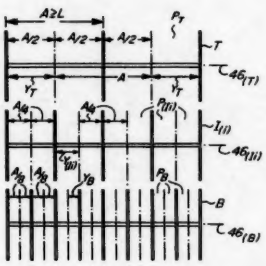
Derek Barnes, West Vancouver, Canada, assignor to MacMillan Bloedel Limited, Vancouver

Filed Jul. 29, 1994, Ser. No. 283,018

Int. Cl.[6] **B65G** *47/24*

U.S. Cl. 198—382 **11 Claims**

1. An orienting system for orienting wood strands comprising at least three decks including a top deck, a bottom deck and at least one intermediate deck between said top and bottom decks to form a series of said at least three decks stacked substantially vertically one directly above the other, substantially vertically extending passages through each of said decks, each of said passages in each said deck having a width defined by a pair of spaced walls, said decks being in vertically adjacent pairs, each of said pairs comprised of an upper deck which may be one of said top deck and said intermediate decks and a lower deck which may be one of said bottom deck or said intermediate decks, said passages through said bottom deck having a preselected width y measured in a first direction between and substantially perpendicular to said walls of said bottom deck, said width y being sufficiently small to ensure orientation of said strands passing therethrough to the desired mean angular deviation relative to a second direction substantially perpendicular to said first direction, said passages in an upper deck of each pair of vertically adjacent decks in said series have widths measured in said first direction correlated with passage widths of passages through its adjacent said lower deck of said pair of decks so that a passage through said upper deck of each said pair of adjacent decks is divided into two passages by passages directly therebelow formed through its adjacent said lower deck of said pair of vertically adjacent decks, the combined widths of said two passages directly therebelow being equal to the width of said passage through said upper deck so that strands falling downward though a passage in said upper deck may fall directly onto only one top edge of a common wall between its said two passages directly therebelow in said lower deck, said top deck forming an upper deck of one of said pairs of vertically adjacent decks and said bottom deck forming a lower deck of another of said pairs of vertically adjacent decks and each said intermediate deck forming an upper deck with its vertically adjacent lower deck and a lower deck with its immediately adjacent upper deck and wherein said walls of said passages in each said upper deck in each said pair of vertically adjacent decks are substantially vertically and axially aligned one with each outer walls of a pair of adjacent of said passages directly therebelow in its said lower deck immediately therebelow.



5,487,461

APPARATUS FOR TRANSPORTING PACKS

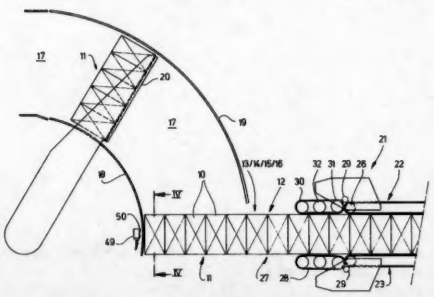
Heinz Focke, and Oskar Balmer, both of Verden, Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Germany

Filed Apr. 6, 1993, Ser. No. 43,485

Claims priority, application Germany, Apr. 7, 1992, 42 11 643.0; Aug. 1, 1992, 42 25 494.9

Int. Cl.[6] **B65G** *15/50*

U.S. Cl. 198—571 **10 Claims**



10. In an apparatus for conveying in a forward conveying direction a string (**12**) of packs which is formed from a plurality of

rows (**13**, **14**, **15**, **16**) of packs disposed above one another, the packs (**10**) being conveyed in a closely packed position and being aligned from row to row, and for forming pack groups (**11**) by pushing off the pack groups transversely to said conveying direction of the pack string (**12**), said apparatus having two side conveyors (**22**, **23**), disposed in regions on opposite sides of the pack string, for applying a first conveying drive to the pack string (**12**) in said conveying direction, the improvement wherein:

a) at least one sensor (**49**) is assigned to each row (**13**, **14**, **15**, **16**) and generates a control signal indicative of the relative position of said each row relative to the other rows;

b) two conveyor belts (**28**) are respectively assigned to, and disposed on opposite sides of, each row (**13** to **16**);

c) said conveyor belts (**28**) are located outside of said regions of said side conveyors (**22**, **23**); and

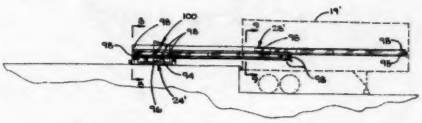
d) the conveyor belts (**28**) are controlled by said control signal generated by said sensor (**49**) such that, if one row (**13** to **16**) lags behind the other rows with respect to said conveying direction, the conveyor belts (**28**) assigned to said one row apply an additional conveying drive to said one row until there is attained an alignment of the packs (**10**) of said one row with the packs of the other rows.

5,487,462

EXTENDABLE CONVEYOR WITHOUT BASE UNIT

Phillip J. Gilmore, Healdsburg, Calif., assignor to Rapistan Demag Corporation, Grand Rapids, Mich.

Division of Ser. No. 131,198, Oct. 1, 1993, Pat. No. 5,423,413.
This application Aug. 25, 1994, Ser. No. 295,947
Int. Cl.[6] B65G *15/26*
U.S. Cl. 198—594 **48 Claims**



1. An extendable conveyor for conveying product between a particular location and a selectable variable location, said extendable conveyor having at least one extendable unit, a stationary support that is configured to be rigidly attached to a support surface for supporting said at least one extendable unit and a conveying surface defined on an extended portion of said at least one extendable unit, wherein said stationary support supports said at least one extendable unit between at least a fully extended position extending forwardly from said stationary support in the direction of said selectable variable location and a fully retracted position extending rearwardly from said stationary support in a direction opposite said direction of said selectable variable location, said stationary support including a forward support portion that provides upwardly directed support for said at least one extendable unit and a rearward support portion that provides downwardly directed support for said at least one extendable unit in said fully extended position, said support portions being separated a distance that is less than one-half of the length of said at least one extendable unit to provide cantilever support for said at least one extendable unit in said extended position from a support area that is significantly shorter than said extendable unit.

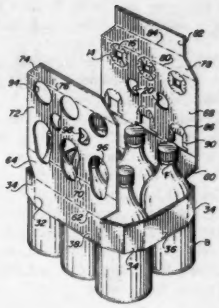
5,487,463

BANDED BOTTLE NECK CARRIER

Randall L. Harris, Powder Springs, Ga., assignor to Riverwood International Corporation, Atlanta, Ga.

Filed Jul. 15, 1994, Ser. No. 276,007
Int. Cl.[6] B65D *75/00*
U.S. Cl. 206—145 **9 Claims**

1. A carrier package for a plurality of rows of bottles having a neck portion which includes an outwardly projecting shoulder, comprising:



a continuous flexible band snugly encircling the bottles;

the band having an upper edge and a lower edge, the lower edge being a free unconnected edge;

opposite side panels connected to the upper edge of the band;

one of the side panels being connected to an outer support panel ply and the other side panel being connected to an inner support panel ply, the outer and inner support panel plies being in face-to-face relationship to form a two-ply support panel;

each support panel ply containing bottle openings which are aligned in the support panel and through which the necks of the bottles extend; and

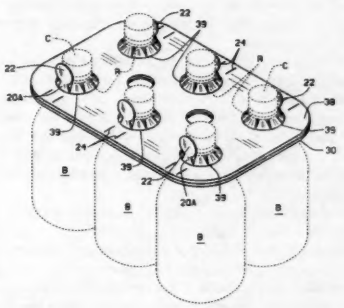
a plurality of support tabs connected to the outer support panel ply by fold lines extending along portions of the periphery of each bottle opening therein, the support tabs having edges engaging the underside of the bottle shoulders.

5,487,464

PAPERBOARD CARRIER WITH CONTAINER RELEASE PROVISION

Richard T. Galbierz, and Michael A. Galbierz, both of St. Louis, Mo., assignors to Imperial Packaging, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 170,012, Dec. 20, 1993, abandoned. This application Jul. 29, 1994, Ser. No. 282,778
Int. Cl.[6] B65D *75/00*
U.S. Cl. 206—149 **21 Claims**



1. A paperboard carrier for containers arranged in side-by-side positions and apertures in the carrier each having a closed margin sized to accommodate the filler ends of the containers, said carrier comprising:

a) a flat paperboard sheet having apertures therein for receiving the group of containers having filler ends;

b) a circular arranged group of tabs delineating each aperture, said tabs projecting radially inwardly from outer ends at said closed margin of said aperture, said group of tabs having inner terminal ends forming an open space in said aperture;

c) one of said group of tabs being formed with an enlarged terminal end substantially filling said open space in said aperture;

d) an embossed ring in said carrier surrounding the closed ends of said group of tabs, said embossed ring forming a hingable connection with each of said tabs;

e) score lines formed in said carrier in alignment with said one tab and extending outwardly from said embossed ring to define a tear strip in said carrier sheet; and

f) said group of tabs being responsive to the insertion of a container filler end into each of said apertures to forcibly pivot said tabs out of the plane of said carrier to support said container filler ends, said enlarged terminal end of said one tab being positioned along side the filler ends of the containers to be accessible to tear out along said score lines to release the containers from said carrier.

5,487,465

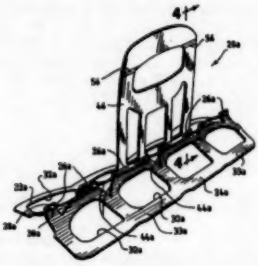
CONTAINER CARRIER

James A. Broskow, Buffalo Grove, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Apr. 20, 1994, Ser. No. 230,308

Int. Cl.[6] B65D *71/00*

U.S. Cl. 206—150 **13 Claims**



1. A carrier for carrying a plurality of containers comprising:

first and second container engaging portions made of a plastic material of a predetermined thickness and freely extending from a joined portion of a predetermined length at adjacent edges of said container engaging portions;

said joined portion being formed by merging juxtaposed surfaces of longitudinal edges of said container engaging portions together; and

said container engaging portions including a plurality of annular bands defining apertures therein for respectively securely holding therein a single container, each said annular band having a height defined by said thickness of the plastic material and a radial width defined by the distance between an outer margin of its aperture and an outer margin of the band, said radial width being substantially greater than said height of the band;

said container engaging portions generally defining a plane along said radial width when the carrier is assembled with containers, said joined portion extending generally perpendicularly with respect to said plane when the carrier is assembled with containers and said joined portion being interrupted along its length to define cut outs between said bands and separated joined portion segments.

10. A carrier for a plurality of containers comprising:

first and second generally planar container engaging portions of plastic sheet material of predetermined thickness and having first longitudinal inner edge margins and opposite outer edges, said inner edge margins having fused facing surfaces providing a joined portion of predetermined length, said container engaging portions including a plurality of annular, substantially planar bands defining apertures therein, each aperture for respectively receiving and retaining a single container, said generally planar container engaging portions being positionable in a first position wherein said container engaging portions extend in the same direction from said joined portion with said outer edges of said container engaging portions adjacent each other and said apertures of said container engaging portions respectively juxtaposed over one another, said generally planar container engaging portions being movable to a second position wherein said container engaging portions are folded oppositely from said joined portion substantially to a common plane for assembly with containers and said joined portion extends generally perpendicularly with respect to said common plane when the carrier is assembled with containers.

5,487,466

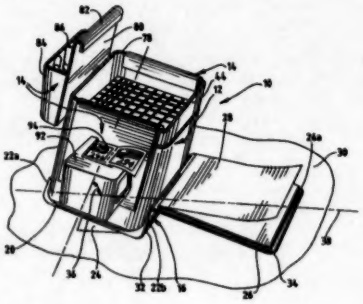
DESKTOP ACCESSORIES HOLDER

Jerry A. Robson, 50 Maple La., Mansfield, Ohio 44906

Continuation of Ser. No. 101,470, Aug. 2, 1993, abandoned. This application Sep. 23, 1994, Ser. No. 311,719

Int. Cl.[6] A45C *11/34;* **B65D** *85/28*

U.S. Cl. 206—214 **12 Claims**



1. A pencil cup comprising:

a cup body having an upwardly facing open end,

a collar portion engaged upon the cup body and forming a mouth of the cup adjacent the open end, and

a mesh of rubber bands having edge portions fastened between the collar portion and the cup body and extending across the upwardly facing open end of the cup body.

5,487,467

DOLL-SHAPED RECEPTACLE FOR PLASTIC BAGS

Victoria Sherman, 3116 Alhambra Cir., Coral Gables, Fla. 33134

Filed May 25, 1994, Ser. No. 248,665

Int. Cl.[6] B65D *83/00*

U.S. Cl. 206—216 **14 Claims**

1. A receptacle for plastic bags and other like articles, comprising:

(a) an upper member having the general shape and appearance of a portion of a doll body, said doll body portion defining a torso, head, and a pair of arms, said upper member comprising an outer shell and an inner support element disposed within said outer shell, said pair of arms being connected together to form a means for holding a towel or like item, said upper member including a garment constructed of fabric material disposed on said outer shell;

(b) a lower element structured and disposed for receiving articles therein, said lower element being shaped and configured as a skirt, said lower element being constructed of fabric material, said lower element being integrally formed with said garment and extending downwardly therefrom, said lower element defining a cavity therein, said lower element including a bottom zone, said bottom zone defining an opening in

communication with said cavity and being sized to allow passage therethrough of an article;

(c) an expandable elasticized band attached to said bottom zone in surrounding relation to said opening, said band being in a normally contracted condition whereby said opening is partially closed; and

(d) a loop of string attached to a rear surface of said head of said upper member.

2. A receptacle for plastic bags and other like articles, comprising:

(a) an upper member having a general configuration and appearance of an upper portion of a doll body;

(b) a lower element structured and disposed for receiving an article therein, said lower element having the general shape and configuration of a skirt, said lower element being attached to said upper member and extending downwardly therefrom, said lower element defining a cavity therein, said lower element having an opening therein in communication with said cavity, said opening being structured and dimensioned to allow passage therethrough of the article and to contain the article within said cavity; and

(c) said upper element further including a pair of arms, said arms being connected together to form a holding member for a towel or like item.

5,487,468

CIGARETTE PACKAGE DESIGN

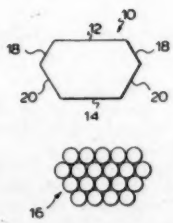
Michael H. Sheahan, Whitby, Canada, assignor to Rothmans, Benson & Hedges Inc., North York, Canada

Continuation of Ser. No. 992,784, Dec. 18, 1992, abandoned. This application Nov. 28, 1994, Ser. No. 348,234

Claims priority, application United Kingdom, Dec. 18, 1991, 9126854

Int. Cl.[6] B65D *85/10*

U.S. Cl. 206—242 **1 Claim**



1. A cigarette package containing cigarettes in an array of said cigarettes arranged in multiple rows, each cigarette in said array having the same cross-sectional dimension and the same length,

said cigarette package comprising a plurality of vertical walls defining a hexagon in cross-sectional shape, said plurality of walls being dimensioned such that said array of cigarettes contained in said package bears against the walls, so that said array of cigarettes has the same cross-sectional shape as said package,

said array of cigarettes being in the form of a nested array of twenty cigarettes in four rows,

said plurality of vertical walls defining a hexagon comprising a front wall, a rear wall parallel to said front wall, first side walls extending at an obtuse angle away from each end of the rear wall and second side walls extending at an obtuse angle away from each end of the front wall to integrally join with the first side walls at a further obtuse angle,

said rear wall engaging five cigarettes in a rear row of said nested array, said front wall engaging four cigarettes in a front row of said nested array, said first side walls engaging the end cigarettes of the rear row and an adjacent row to said rear row in said nested array containing six cigarettes and said second side walls engaging the end cigarettes of the front row and an adjacent row to said front row in said nested array containing five cigarettes.

5,487,469

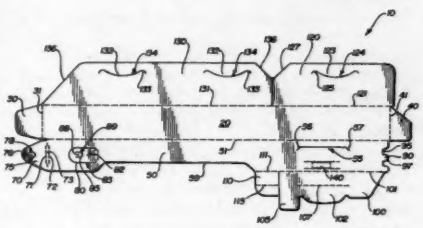
PACKAGE FOR ENDOSCOPIC INSTRUMENT

Constance Roshdy, New Egypt, N.J., and E. Paul Johnson, San Angelo, Tex., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jan. 25, 1994, Ser. No. 187,274

Int. Cl.[6] B65D *85/20*

U.S. Cl. 206—363 **8 Claims**



1. A foldable package for an endoscopic suturing device comprising:

a base panel having a pair of opposed major sides and a pair of opposed minor sides;

a first upper closure panel foldably mounted to the first major side of the base panel;

a second, lower closure panel foldably mounted to the first major side of the base panel below the first closure panel;

a mounting panel having a pair of opposed major sides and a pair of opposed minor sides mounted to the other major side of the base panel along a first major side of the mounting panel;

a retaining panel mounted to the other major side of the mounting panel;

a bottom tab panel foldably mounted to the lower minor side of the base panel;

a top panel extending from the opposite upper minor side of the base panel;

needle park means mounted to the mounting panel;

means for locking the closure panels to the base panel and mounting panel; and,

means for locking the retaining panel to the base panel.

7. A foldable package for an endoscopic suturing device comprising:

a base panel having a pair of opposed major sides and a pair of opposed minor sides;

a first upper closure panel foldably mounted to the first major side of the base panel;

a second, lower closure panel foldably mounted to the first major side of the base panel below the first closure panel;
a mounting panel having a pair of opposed major sides and a pair of opposed minor sides mounted to the other major side of the base panel along a first major side of the mounting panel;
a retaining panel mounted to the other major side of the mounting panel;
a bottom tab panel foldably mounted to the lower minor side of the base panel;
a top panel extending from the opposite upper minor side of the base panel;
needle park means mounted to the mounting panel;
means for locking the closure panels to the base panel and mounting panel; and
means for locking the retaining panel to the base panel comprising a tab extending from the retaining panel and a tab pocket in the mounting panel.

8. A foldable package for an endoscopic suturing device comprising:
a base panel having a pair of opposed major sides and a pair of opposed minor sides;
a first upper closure panel foldably mounted to the first major side of the base panel;
a second, lower closure panel foldably mounted to the first major side of the base panel below the first closure panel;
a mounting panel having a pair of opposed major sides and a pair of opposed minor sides mounted to the other major side of the base panel along a first major side of the mounting panel;
a retaining panel mounted to the other major side of the mounting panel;
a bottom tab panel foldably mounted to the lower minor side of the base panel;
a top panel extending from the opposite upper minor side of the base panel;
needle park means mounted to the mounting panel;
means for locking the closure panels to the base panel and mounting panel wherein the locking means for the closure panels comprises tab pockets for engaging the base panel and mounting panel;
a suture retaining tab extending from a, top minor side of the mounting panel;
a pull tab extending from the retaining panel;
a stability tab foldably mounted to the second major side of the mounting panel below the retention panel; and,
means for locking the retaining panel to the base panel comprising a tab extending from the retaining panel and a tab pocket in the mounting panel.

5,487,470

MERCHANDISE ENCAPSULATING PACKAGING SYSTEM AND METHOD THEREFOR

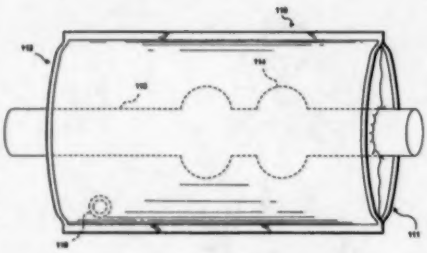
Daniel A. Pharo, Los Angeles, Calif., assignor to Puff Pac Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 22,654, Mar. 1, 1993, abandoned, which is a continuation of Ser. No. 920,006, Jul. 27, 1992, abandoned, which is a continuation of Ser. No. 780,522, Oct. 17, 1991, abandoned, which is a continuation of Ser. No. 518,992, May 4, 1990, abandoned. This application Dec. 30, 1994, Ser. No. 367,678

Int. Cl.[6] B65D *81/02;30/00*

U.S. Cl. 206—522 **1 Claim**

1. A packaging system comprising an outer bag having opposite ends each with an opening formed therein, an inner bag mounted within said outer bag having a pair of opposite ends each with an opening formed therein, said openings cooperating to define a pocket extending through said packaging system and adapted to retain delicate portions of an article therein while other portions of said article extend from said packaging system though said openings, said inner bag being secured to said outer bag to suspend said inner bag within said outer bag, said outer and inner bags defining



a chamber therebetween, means for at least substantially filling said chamber with a filler medium to substantially surround said inner bag and said delicate portions of said article therewith, and a plurality of additional seals between at least a portion of a pair of adjacent surfaces of each of said outer bag and said inner bag at locations other than where said inner bag is suspended from said outer bag, said additional seals maintaining communication of said filler medium within said chamber.

5,487,471

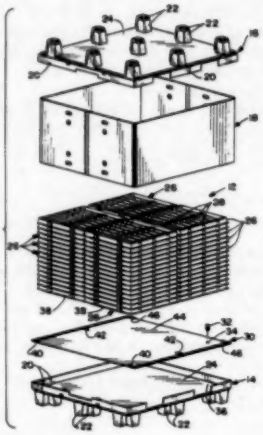
PACKAGING CONTAINER ASSEMBLY FOR ELECTRICAL CONNECTOR COMPONENTS

Kyle J. Marchek, Lisle, and Timothy R. McClelland, Bolingbrook, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Oct. 19, 1994, Ser. No. 325,764

Int. Cl.[6] B65D *85/38;85/62*

U.S. Cl. 206—725 **7 Claims**



1. A packaging container assembly for electrical connector components, comprising:
a pallet;
a tray alignment plate positionable onto the pallet;
at least one tray positionable onto the alignment plate and including means for supporting electrical connector components in a given orientation;
complementary interengaging alignment means between the tray and the alignment plate for assuring proper alignment of the tray relative to the alignment plate and, thereby, assuring proper orientation of the electrical connector components within the assembly; and
wherein said alignment means comprise at least one set of generally parallel elongated slots, and the alignment means on the tray comprise means for positioning within the slot.

4. A packaging container assembly for electrical connector components, comprising:

a pallet;

a tray alignment plate positionable onto the pallet;

at least one tray positionable onto the alignment plate and including means for supporting electrical connector components in a given orientation;

complementary interengaging alignment means between the tray and the alignment plate for assuring proper alignment of the tray relative to the alignment plate and, thereby, assuring proper orientation of the electrical connector components within the assembly,

wherein said pallet includes a generally planar top wall, and said tray alignment plate comprises a sheet-like member for positioning onto the top wall; and

wherein said alignment means include slots in the sheet-like member.

5,487,472

COLOR SORTER FOR SORTING OUT MOLDY PULSE

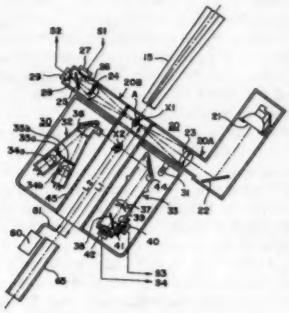
Satoru Satake, Tokyo; Tadanobu Inaashi, and Takafumi Ito, both of Hiroshima, all of, Japan, assignors to Satake Corporation, Tokyo, Japan

Filed Jun. 30, 1994, Ser. No. 269,109

Claims priority, application Japan, Jun. 30, 1993, 5-183451

Int. Cl.[6] B07C *5/342;5/00*

U.S. Cl. 209—581 **9 Claims**



1. A pulse color sorter comprising:

a pulse feeder for continuously feeding pulse to be examined to a first and a second detecting position with a predetermined distance provided therebetween;

a first detector arranged at said first detecting position and including first illuminating means for illuminating said pulse passing said first detecting position, and first light-receiving means for receiving light of different wavelengths dispersed and transmitted through said pulse and generating a first and a second detection signal on the basis of light of said different wavelengths, said first light-receiving means having spectral means for dividing said dispersed and transmitted light from said pulse into two different light beams directed in different directions, a short wavelength pass optical filter for selectively passing a particular short wavelength region of one of said two light beams from said spectral means, a first light receiver for detecting intensity of light passed through said short-wavelength pass optical filter, a long-wavelength pass optical filter for selectively passing a long wavelength region of the other one of said two light beams from said spectral means, and a second light receiver for detecting intensity of light passed through said long-wavelength pass optical filter;

a second detector arranged at said second detecting position and including a second illuminating means for illuminating said pulse passing said second detecting position, a reference color means having a brightness control function, and a second light-receiving means opposing said reference color means with said second detecting position intervened therebetween, for receiving light reflected by said pulse illuminated by said second illuminating means and light from said reference color means and generating a third detection signal on the basis of a difference between intensity of said light reflected by said pulse and intensity of said light from said reference color means;

a controller for calculating a ratio between said first and second detection signals generated by said first detector and judging said pulse as an abnormal pulse, thereby generating an eject signal for ejecting said abnormal pulse, when the resultant ratio calculated is outside a first predetermined threshold range or said third detection signal generated from said second detector is outside a second predetermined threshold range; and

an ejector connected to said controller and operable in response to said eject signal to eject said abnormal pulse to a flow-down path different from a flow-down path through which said normal pulse is allowed to flow down.

5,487,473

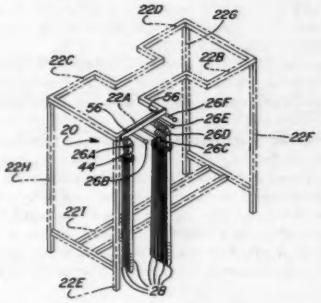
BELT RACK VENDING FIXTURE

Allan L. Ford, Melrose Park, Pa., assignor to Reborn Products Co., Inc., Bensalem, Pa.

Filed Aug. 18, 1993, Ser. No. 108,352

Int. Cl.[6] A47F *7/00*

U.S. Cl. 211—59.1 **16 Claims**



1. A rack for displaying and vending plural belts, said belts being in plural groups of different sizes, with the number of belts in each group being directly proportional to the popularity of belts of that size, said rack comprising a base and a plurality of prong members, said base comprising at least one elongated member from which said plurality of prong members project outward, said elongated member including a pair of ends and a center, said base being arranged for mounting the rack onto a support, each of said prong members being arranged in increasing length order from the ends of said elongated member inward to said center and being of length directly proportional to the number of belts in the group suspended therefrom, so that when said group of belts is suspended therefrom said prong member is full.

5,487,474

DEVICE FOR DISPLAYING ARTICLES

Bernard Heimendinger, Montmorency, France, assignor to FAPEC, Montmorency, France

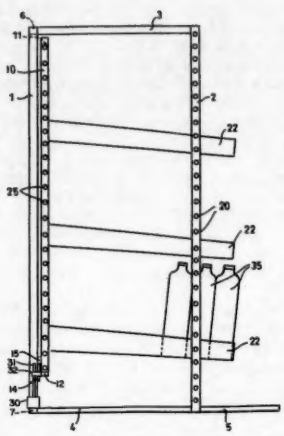
Filed May 9, 1994, Ser. No. 239,620

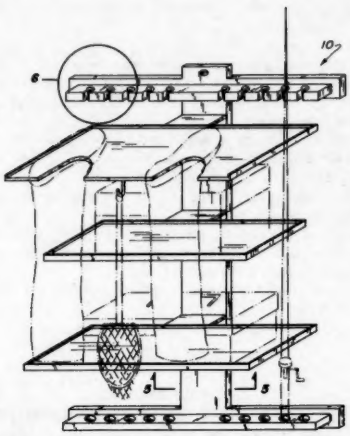
Int. Cl.[6] A47F *5/00*

U.S. Cl. 211—59.2 **3 Claims**

1. Device for displaying articles which comprises:

fixed frame means comprising front and rear vertical stanchions interconnected by front, rear and side crossmembers,





adjustable rear frame means slidingly supported by said fixed frame means, which comprises rear vertical stanchions braced by crossmembers,

at least one horizontal front load bar supported by said front vertical stanchions of the fixed frame means,

at least one horizontal rear load bar supported by said rear vertical stanchions of the adjustable rear frame means,

at least one display rack of which a front part is pivotally supported by said front load bar and of which a rear part is supported by said rear load bar,

a lost motion connection provided between said fixed frame means and adjustable rear frame means whereby the adjustable rear frame means can be moved relative to said fixed frame means and

drive means which includes a motor having a movable element secured to said adjustable rear frame means for moving said rack between a downwardly extending position so that the articles contained in said rack are automatically placed via gravity in front of the rack and an upwardly extending position where the rack slants toward the rear to allow easy reloading of said rack with articles which, via gravity, are automatically disposed at the rear portion of the rack.

5,487,475

FISHING EQUIPMENT STORAGE APPARATUS

Raymond W. Knee, 118 Wright Rd., Delta, Pa. 17314

Filed Dec. 8, 1994, Ser. No. 352,398

Int. Cl.[6] A47F *7/00*

U.S. Cl. 211—70.8 **6 Claims**

1. A new and improved fishing equipment storage apparatus for organizing fishing gear so that it can all be kept in one place comprising, in combination:

a vertical rectangular base having a first end, a second end, an intermediate extent therebetween, and two side portions, the rectangular base having an aperture formed therethrough downwardly of the first end, the aperture serving to allow the vertical rectangular base to be mounted to a wall;

an upper panel integral with the vertical rectangular base downwardly of the aperture formed therethrough, the upper panel extending outwardly from the rectangular base from the two side portions thereof, the upper panel having a plurality of soft foam strips secured to a front surface thereof, the plurality of soft foam strips serving to receive fishing rod tips securably therein;

an upper shelf having an upper surface, a lower surface, a front end, and a back end, the back end having an extension integral therewith, the front end having a plurality of cutouts therein, the cutouts serving to allow hip boots or chest waders to be hung therefrom, the lower surface of the extension having an upper portion of a first shelf bracket secured thereto, a lower portion of the first shelf bracket secured to the intermediate extent of the vertical rectangular base downwardly of the upper panel, a hook secured to the lower surface of the upper shelf inwardly of the front end;

a middle shelf having an upper surface, a lower surface, a front end, and a back end, the back end having an extension integral therewith, the lower surface of the extension having an upper portion of a second shelf bracket secured thereto, a lower portion of the second shelf bracket secured to the intermediate extent of the vertical rectangular base downwardly of the upper shelf;

a lower shelf having an upper surface, a lower surface, a front end, and a back end, the back end having an extension integral therewith, the lower surface of the extension having an upper portion of a third shelf bracket secured thereto, a lower portion of the third shelf bracket secured to the intermediate extent of the vertical rectangular base downwardly of the middle shelf;

a bottom panel integral with the vertical rectangular panel upwardly of the second end thereof, the bottom panel extending outwardly from the rectangular base from the two side portions thereof, the bottom panel having a plurality of recesses therein, the recesses serving to receive ends of the fishing rods therein.

5,487,476

ORNAMENTAL TREE FLOWER POT DISPLAYS

Marvin W. Barfield, Rte. 2, Box 805, Rockville, Va. 23146

Filed Mar. 29, 1994, Ser. No. 219,280

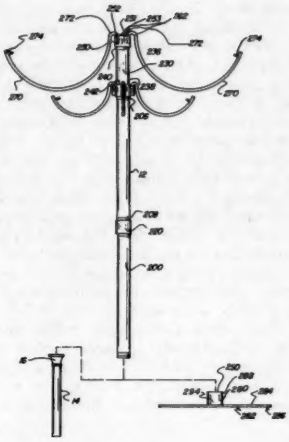
Int. Cl.[6] A47F *5/00*

U.S. Cl. 211—71 **10 Claims**

1. A new and improved ornamental tree flower pot display comprising, in combination:

an upper support pipe comprised of metal and formed as a hollow cylinder with openings at both ends, the pipe having an upper end and a lower end and an inner surface and an outer surface, the pipe also including a plurality of external screw threads on the outer surface of its uppermost extent and lowermost extent, with the pipe adapted to be positioned vertically in the operative orientation with a length measuring between about four feet and six feet;

a lower support bar comprised of metal and formed as a hollow cylinder with openings at both ends, the bar having an upper end and a lower end and an inner surface and an outer surface, the bar also including a plurality of external screw threads on the outer surface of its upper most extent and lowermost



extent, with the bar adapted to be positioned vertically in the operative orientation with a length measuring between about eighteen inches and thirty inches, with the lower support bar having a smaller diameter than the upper support pipe;

a joint comprised of metal and formed in a hollow generally cylindrical configuration with openings at both ends, the joint having an upper region and a lower region and an inner surface and an outer surface, with the upper region and its corresponding opening having a larger diameter than the lower region and its corresponding opening, with the opening in the upper region including a plurality of internal screw threads on its inner surface to permit releasable coupling with the lowermost extent of the upper support pipe, with the opening in the lower region including a plurality of internal screw threads on its inner surface to permit releasable coupling with the uppermost extent of the lower support bar;

a four unit branch ring comprised of metal and including a center piece formed in a hollow generally cylindrical configuration with openings at both ends, the center piece having an inner surface and an outer surfaced with a plurality of internal screw threads throughout the entire extent of its inner surface, the center piece including four equidistantly positioned metal branch holders affixed to its outer surface, the holders being formed in a hollow generally cylindrical configuration with openings at both ends, each holder having a small circumference and a length measuring between about sixty and eighty percent of the length of the center piece, the holders being centrally located on the center piece with their open ends positioned in unison with the open ends of the center piece, the ring adapted to be coupled with the uppermost extent of the upper support pipe in the operative orientation;

a ring cap comprised of metal and formed in a planar generally cylindrical configuration, the cap having a flat upper surface and a flat lower surface with a cylindrically shaped side therebetween, the side including a plurality of external screw threads throughout its extent to permit releasable coupling with the four unit branch ring, the upper surface having a generally hexagon shaped nut affixed to its central portion, the nut including a centrally located circular aperture extending therethrough; and

four branches, each branch being comprised of metal and formed as a long thin cylindrical member shaped in a generally semi-circular configuration, each branch having two free ends, a first free end terminating in an outwardly extending hook, a second free end terminating in a flat surface and includes a generally perpendicularly extending cylindrically shaped projection located proximate to the flat surface, each end of each branch capable of being inserted into one of the four branch holders of the branch ring when the ring being coupled to the upper support pipe is in the operative orientation, the projection being positioned to point toward the hook on the first free end of the branch when in the operative orientation.

5,487,477

Patent Not Issued For This Number

5,487,478

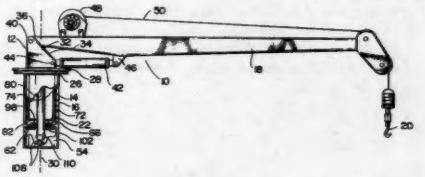
INVERTED KINGPOST CRANE

William D. Morrow, 13223 Spencer Rd., Houston, Tex. 77041

Filed Oct. 17, 1994, Ser. No. 323,857

Int. Cl.[6] B66C *23/84*

U.S. Cl. 212—253 **20 Claims**



1. An inverted kingpost crane comprising:

a vertical, elongated sleeve having a vertical sleeve axis;

said sleeve including a cross-member vertically spaced from an upper end of said sleeve;

an axial cross-member opening extending vertically through said cross-member;

a vertical, elongated kingpost having a vertical kingpost axis;

said kingpost rotatable within said sleeve;

upperworks, including boom, mounted on said kingpost;

upper bearing means intermediate said kingpost and said sleeve;

lower bearing means comprising a bearing block;

said bearing block slidably positioned in said cross-member opening;

a bearing block retainer removably affixed to said cross-member;

said bearing block retainer positioned and constructed to provide vertical support for said bearing block and selectively maintain said bearing block in said cross-member opening;

thereby said bearing block may be removed and installed in said cross-member opening without removal of said kingpost from said sleeve;

said bearing block extending above said cross-member when operatively positioned in said cross-member opening; and

thereby a bearing block upper surface contacts a kingpost lower surface.

5,487,479

METHOD FOR NESTING LONGITUDINALLY DIVISIBLE CRANE BOOM SEGMENTS

David J. Pech; Robert J. Walker, both of Manitowoc, and Michael J. Wanek, Two Rivers, all of Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

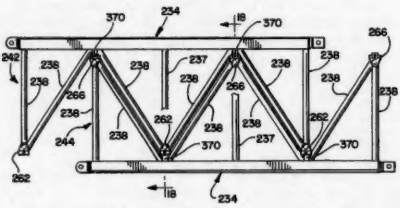
Continuation-in-part of Ser. No. 980,499, Nov. 23, 1992, Pat. No. 5,406,767. This application Feb. 4, 1993, Ser. No. 13,640

Int. Cl.[6] B66C *23/64;* **B65G** *57/00;* **E04C** *3/02;* **E04H** *12/00*

U.S. Cl. 212—270 **14 Claims**

1. A method of nesting the sections of a longitudinally divisible crane boom segment for transport comprising the following steps:

a) providing a crane boom segment longitudinally divisible into at least a first and second section, each of the sections comprising at least one chord member and a plurality of partial lacing elements having a first end permanently attached to the



at least one chord member and a second end attached to a partial lacing element of the other of said sections, at least the first section having at least one bracket thereon;

b) disconnecting the second end of the plurality of partial lacing elements of the first section from the partial lacing elements of the second section;

c) translating one of the sections longitudinally with respect to the other of said sections;

d) placing the at least two sections in a nested configuration; and

e) connecting the nested first and second sections together by connecting the second end of at least one of the partial lacing elements of the second section to the at least one bracket of the first section.

5,487,480

HYDRO-PNEUMATIC CUSHIONING DEVICE

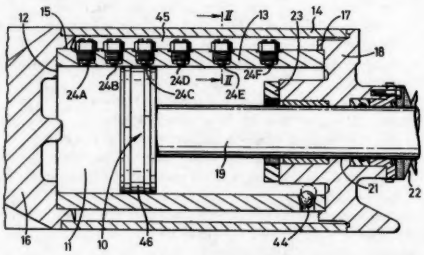
Ronald C. Page, Coventry; John J. Bushnell, Leamington Spa, and Terence D. Williams, Coventry, all of, United Kingdom, assignors to Oleo International Holdings Limited, Coventry, United Kingdom

Filed Jun. 10, 1994, Ser. No. 257,704

Claims priority, application United Kingdom, Jun. 10, 1993, 9311999

Int. Cl.[6] B61G *9/00*

U.S. Cl. 213—43 **6 Claims**



1. A hydro-pneumatic cushioning device for use in an end-of-car coupler for a railway vehicle, the cushioning device comprising structure forming a cylinder chamber which has an axis and which is closed at a first end, and an annular chamber which surrounds the cylinder chamber, there being metering holes in the structure which provide metered communication between the chambers, each metering hole being spaced from the other metering holes in a direction which is parallel to the axis of the cylinder chamber, and a plunger which is slidable within the cylinder chamber and which has a rod portion which passes through a second end of the cylinder chamber in a fluid-tight manner, the cylinder chamber being filled with liquid and there being a volume of gas within the annular chamber when the device is used, the gas acting through the liquid to urge the plunger towards said second end of the cylinder chamber when the device is not loaded, wherein each of said metering holes has a respective valve fitted into it, each valve comprising a stepped piston which has two ends and an intermediate portion which is a sliding fit in a part of said structure between said cylinder chamber and said annular chamber, the diameter of the stepped piston being smaller at one of its ends than it is at the other of its ends, the smaller diameter end of the piston serving as an obturating member which is adapted to seat on a valve seat formed around the respective metering hole whereby to close that metering hole and the larger diameter end being exposed to pressure in said annular chamber which acts on the stepped piston to seat the smaller diameter end on said valve seat whereby passage of liquid through the respective metering hole is inhibited when a force which is less than a predetermined threshold force is applied to urge the plunger axially within the cylinder chamber, the valve being operable to be opened to allow displacement of liquid between the chambers when a force which is greater than the predetermined threshold force is applied to urge the plunger within the cylinder chamber, whereby there is no displacement of liquid from the cylinder chamber to the annular chamber when any force is applied to urge the plunger axially within the cylinder chamber is less than said predetermined threshold force and whereby all said valves between said plunger and the end of the cylinder chamber towards which it is urged open substantially simultaneously to allow displacement of liquid between the chambers through all the metering holes between the plunger and the end of the cylinder chamber towards which the plunger is urged when a force in excess of said predetermined threshold force is applied to the plunger.

5,487,481

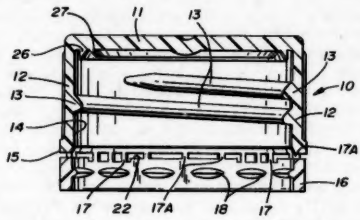
TAMPER EVIDENT PLASTIC CLOSURE

Dieter Sander, 315 Watline Avenue, Mississauga Ont., Canada, and Uwe F. Meyer, 50 Meadowbank Road, Islington Ont., Canada

Filed Oct. 31, 1994, Ser. No. 332,589

Int. Cl.[6] B65D *39/00*

U.S. Cl. 215—252 **8 Claims**



1. A tamper evident closure comprising a top portion, an annular depending skirt extending therefrom, a tamper indicating ring connected to said depending skirt by a plurality of circumferentially spaced frangible elements, said tamper indicating ring having a plurality of annularly spaced elevated bridge portions thereon extending axially towards said depending skirt, the elevated bridge portions defining areas of decreased ring spacing from said depending skirt, some of said frangible elements extending from said elevated bridge portion to said depending skirt, said tamper indicating ring including circumferentially spaced inwardly facing arcuate projections and an internal spiral thread on said depending skirt.

5,487,482

HANDLED CLOSURE DEVICE

Lawrence W. Rocheleau, 101 Coppermill Rd., Wethersfield, Conn. 06109

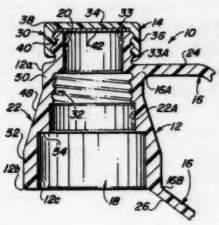
Filed Jan. 14, 1994, Ser. No. 182,638

Int. Cl.[6] B65D *23/12*

U.S. Cl. 215—396 **14 Claims**

1. A handled closure device for mounting to a bottle having a closure cap, said device comprising:

(a) a closure body having spaced upper and lower portions and defining an interior cavity extending between said upper and



lower portions, said interior cavity having an open bottom adapting said closure body to be fitted over and receive an upper portion of a bottle containing a liquid and after a closure cap applied on the upper portion of the bottle is removed therefrom;

(b) first mounting means defined on said upper portion of said closure body for mounting the closure cap to undergo rotational movement relative to said upper portion of said closure body between an opened position wherein the closure cap is removed from said closure body and the flow of the liquid from the bottle through the device is permitted and a closed position wherein the closure cap is secured over and seals with said upper portion of said closure body and the flow of the liquid from the bottle through said device is prevented;

(c) second mounting means defined on said closure body for removably mounting said closure body on the upper portion of the bottle, said second mounting means being spaced above said lower portion of said closure body and said open bottom of said interior cavity therein and adjacent to said first mounting means on said upper portion of said closure body and thus located closer to said first mounting means on said upper portion of said closure body than to said lower portion thereof; and

(d) a handle disposed exteriorly of said closure body and being attached to and extending outwardly from said closure body.

5,487,483

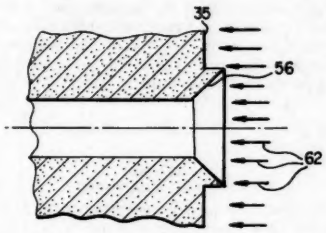
NOZZLES FOR INK JET DEVICES AND METHOD FOR MICROFABRICATION OF THE NOZZLES

Joel A. Kubby, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 24, 1994, Ser. No. 248,047

Int. Cl.[6] B44C *1/22*

U.S. Cl. 216—27 **34 Claims**



1. A method for microfabricating an ink jet nozzle including the steps of:

physical sputter erosion of a front face of the ink jet nozzle to expose (111) crystallographic planes around an orifice of the ink jet nozzle; and

chemically etching a remainder of the front face of the ink jet nozzle at a rate between 35–400 times faster than the (111) crystallographic planes to create a lip surrounding the orifice.

5,487,484

DEVICE FOR THE AIRTIGHT CLOSING OF A PACKAGE WITH FAST OPEN-AND-SHUT SYSTEM

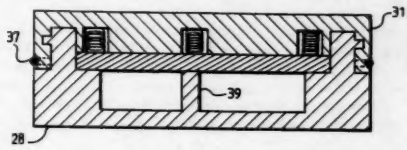
Philippe Bonniau, Houilles, and Jean Chazelas, Paris, both of, France, assignors to Thomson - CSF, Paris, France

Filed Jun. 10, 1994, Ser. No. 258,204

Claims priority, application France, Jun. 11, 1993, 93 07051

Int. Cl.[6] B65D *55/00;45/32*

U.S. Cl. 220—201 **8 Claims**



1. A device for the airtight closing of fast open-and-shut packages; which comprises:

a first lid fixed to an open face of a package, said package including an interior compartment;

at least one shape memory alloy spring located outside said compartment and biasing the lid toward the compartment; and

a facing lid fixedly connected to the package and facing the first lid wherein the springs are positioned between the first lid and the facing lid.

5,487,485

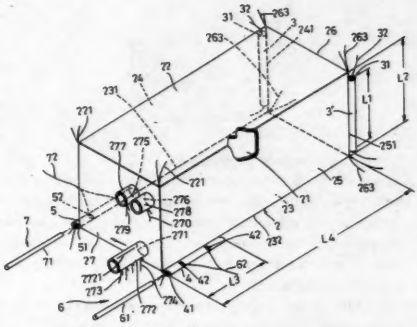
LINER FOR A CARGO CONTAINER

Ming-Sheng Yang; Yu-Show Cherng, and Chien-Te Lu, all of Tainan, Taiwan, Prov. of China, assignors to Chi Mei Corporation, Taiwan, Prov. of China

Filed Apr. 13, 1995, Ser. No. 421,535

Int. Cl.[6] B65D *87/00*

U.S. Cl. 220—403 **17 Claims**



1. A liner mounted within a cargo container for receiving bulk cargo, said cargo container having attachment elements for connection with said liner, said liner comprising:

an expansible liner body having an expanded shape adapted to fit inside the cargo space of said cargo container, said liner body including a top panel, a bottom panel opposite to said top panel, a left side panel interconnecting left edges of said top and bottom panels, a right side panel interconnecting right edges of said top and bottom panels, a front panel interconnecting front edges of said top, bottom, left side and right side panels, and a rear panel interconnecting rear edges of said top, bottom, left side and right side panels, all of said top, bottom, left side, right side, front and rear panels together defining an accommodation space thereamong for receiving the bulk cargo, said rear panel having an outlet opening formed therethrough and communicated with said accommodation space;

a first reinforcing member secured to and along said front edge of said left side panel of said liner body;

a second reinforcing member secured to and along said front edge of said right side panel of said liner body;

a first connecting member provided outwardly of said left side panel, and secured to and along said left edge of said bottom panel of said liner body adjacent to said rear panel;

a second connecting member provided outwardly of said right side panel, and secured to and along said right edge of said bottom panel of said liner body adjacent to said rear panel; and

left and right pulling members mounted respectively to said first and second connecting members to pull said first and second connecting members upwardly and to raise the dead corners formed adjacent to said first and second connecting members to cause parts of the bulk cargo retaining in the dead corners to fall towards said outlet opening.

5,487,486

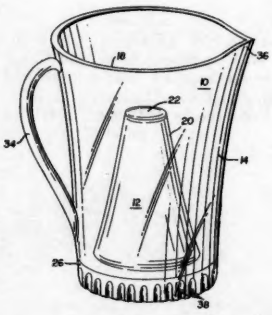
BEVERAGE CONTAINER WITH ICE COMPARTMENT FILLED BY INVERTED SCOOPING

David M. Meneo, 241 Karen Dr., Orange, Conn. 06477-2935

Continuation of Ser. No. 114,436, Aug. 30, 1993, abandoned, which is a continuation-in-part of Ser. No. 920,018, Jul. 27, 1992, abandoned. This application Jan. 19, 1995, Ser. No. 374,850

Int. Cl.[6] B65D *25/04*

U.S. Cl. 220—504 **23 Claims**



1. A beverage container comprising:

an upwardly open and downwardly closed beverage compartment having an upward opening for receiving beverages that extends across substantially the entire width of the beverage compartment, the beverage compartment being downwardly closed across the entire width of the upward opening of the beverage compartment;

an upwardly closed and downwardly open frusto-conical ice compartment positioned inwardly with respect to the beverage compartment in permanent heat exchange contact with the beverage compartment, the ice compartment being integrally molded as one piece with the beverage compartment of an impact resistant material sufficient to resist repeated scooping impacts with crushed ice and having a sealable downward opening for receiving ice into the ice compartment, the downward opening extending across substantially the entire width of the ice compartment and including a lip suitable for scooping into crushed ice;

a handle attached to the beverage container adapted for use in an upright and in an inverted position and cooperating with the ice compartment and the downward opening thereof to form an ice scoop for scooping ice into the ice compartment, the handle having a comfortable shape when held tightly and a comfortable angle of connection to the container at a top and bottom end of the handle such that a user's fingers are not compressed between the handle and the container when the container is held in an upright position for filling the beverage compartment with a beverage and when held in an inverted position for scooping ice into the ice compartment; and

a cap for sealing the downward opening of the ice compartment when the beverage compartment is upright to retain ice scooped into the ice compartment, the cap including internal threads for engaging external threads on the beverage container to seal the cap across the downward opening of the ice compartment.

5,487,487

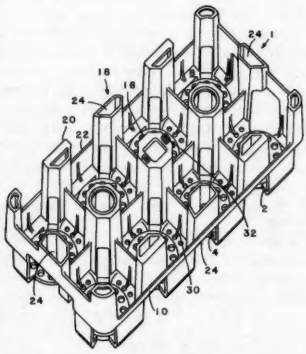
CRENELATED CONTAINER CASE

Roy Hammett, Odessa, Fla., assignor to International Container Systems, Inc., Tampa, Fla.

Continuation-in-part of Ser. No. 241,614, May 11, 1994, Pat. No. 5,421,471. This application Jul. 28, 1994, Ser. No. 283,204

Int. Cl.[6] B65D *1/24*

U.S. Cl. 220—509 **11 Claims**



1. A nestable case for carrying a plurality of containers, comprising:

a) a base having a top surface and a bottom surface, wherein said top surface comprises a plurality of areas corresponding to the plurality of containers; and

b) a crenelated sidewall connected to said base and extending around said top surface of said base, said crenelated sidewall being dimensioned such that when an identical case is nested thereon, the sidewall of the identical case nests into the overlying case more than one-quarter the depth of the overlying case, and when the identical case is cross-stacked thereon, the identical case nests into the overlying case more that one-third the depth of the overlying case.

5,487,488

VENDING MACHINE

Wan J. Cho, Busan, Rep. of Korea, assignor to LG Industrial Systems Co., Ltd., Seoul, Rep. of Korea

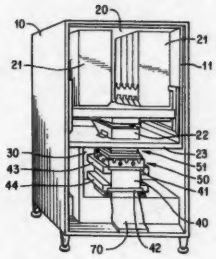
Filed Jun. 1, 1994, Ser. No. 252,357

Claims priority, application Rep. of Korea, Jun. 2, 1993, 9522/1993 U; Jun. 29, 1993, 11663/1993 U

Int. Cl.[6] B65D *83/00*

U.S. Cl. 221—150 HC **21 Claims**

1. A vending machine having a food storage box, a food freezing chamber having a chute for permitting the food from the food storage box to fall down, a food heating apparatus for heating the food fallen from the chute, and a food heating chamber having a food discharging port for discharging the heated food, comprising:



a movable type cooled air discharging prevention means, provided between a food discharging opening provided at a lower portion of the chute and an upper shutter provided at an upper portion of the food heating apparatus, for preventing cooled air from being discharged outside; and

a stationary type supporting means, provided between a lower plate of the food freezing chamber and the movable type cooled air discharging prevention means, for permitting the movable type cooled air discharging prevention means to smoothly move and to absorb impacts thereon.

5,487,489

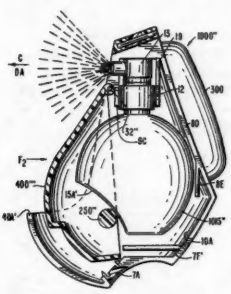
PUMP DISPENSER WITH MOVABLE BOTTLE

Stephan Weiss, 211 E. 70th St., New York, N.Y. 10021, and David Seidler, Forest Hills, N.Y., assignors to Stephan Weiss, New York, N.Y.

Division of Ser. No. 111,291, Aug. 24, 1993, Pat. No. 5,377,869, which is a continuation-in-part of Ser. No. 938,889, Aug. 31, 1992, abandoned, and a continuation-in-part of Ser. No. 937,656, Aug. 27, 1992, Pat. No. Des. 352,890, and a continuation-in-part of Ser. No. 936,253, Aug. 27, 1992, Pat. No. Des. 353,993. This application Nov. 21, 1994, Ser. No. 342,888

Int. Cl.[6] **B67D** *5/64*

U.S. Cl. 222—1 **15 Claims**



1. A method for pump spray dispensing a liquid from a vessel comprising the steps of

1) maintaining a pump spray dispensing means of the vessel for dispensing a liquid in a substantially stationary position in a portable housing for the vessel; and,

2) moving the vessel relative to said pump spray dispensing means in response to an activating force applied by a user along a first axis to cause the liquid to dispense from the pump spray dispensing means along a second axis wherein there is an angle α between the first and second axes and α is greater than 90° and less than about 270° or greater than about 270° and less than about 90°; and, there is a pumping axis of the pump spray dispensing means which is substantially perpendicular to the first axis.

5,487,490

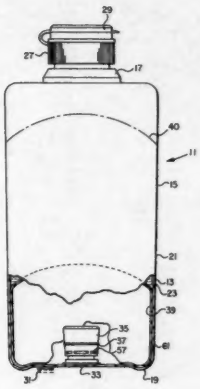
PRODUCT DISPENSER WITH AIR DISPLACEMENT DEVICE

David W. Estes, Arlington, Tex., assignor to CODEV Corp., Rockford, Ill.

Continuation of Ser. No. 220,907, Mar. 30, 1994, abandoned. This application Dec. 9, 1994, Ser. No. 352,532

Int. Cl.[6] **B65D** *35/28;37/00*

U.S. Cl. 222—1 **20 Claims**



5. In a product dispenser of the type having a plastic squeeze bottle with a bottom, a top and a resilient sidewall which define a volume for containing a product therein, a dispensing orifice which extends from within the plastic squeeze bottle for passing the product from the volume to an exterior of the plastic squeeze bottle, an inflatable element having an expandable wall disposed within the plastic squeeze bottle for receiving air from the exterior of the plastic squeeze bottle and expanding against the resilient sidewall in response to negative pressures within the plastic squeeze bottle caused by releasing external pressure applied to the resilient sidewall, and wherein the air is contained within the inflatable element to separate the air from the product and to urge the inflatable element to fill a void within the volume created by evacuating a portion of the product from within the plastic squeeze bottle, the improvement comprising in combination:

a valve body having a seal surface and a first orifice, the first orifice extending through the valve body and the seal surface for passing the air flowing from the exterior of the plastic squeeze bottle through the valve body and through the seal surface;

a flow port extending through the valve body and the seal surface, at a first point which is distal from the first orifice, for passing the air through the seal surface and the valve body, and into the inflatable element;

a diaphragm disposed for pressing against the seal surface between the first orifice and the flow port in response to positive pressures within the inflatable element, and for lifting from the seal surface between the first orifice and the flow port in response to the negative pressures within the plastic squeeze bottle;

wherein lifting the diaphragm from the seal surface in response to the negative pressures within the plastic squeeze bottle passes the air from the exterior of the plastic squeeze bottle through the first orifice, across the seal surface, through the flow port, and into the inflatable element; and

wherein pressing the diaphragm into the seal surface in response to the positive pressures within the inflatable element seals between the flow port and the first orifice, to seal air within the inflatable element.

5,487,491

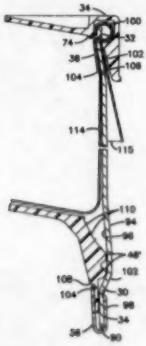
CARTRIDGE DISPENSER WITH INTERIOR BAG AND INTERLOCKING LID

Ernest L. Smith, Kansas City, Mo., and Joseph A. Pantelleria, Overland Park, Kans., assignors to Sealright Company, Inc., Kansas City, Mo.

Continuation-in-part of Ser. No. 71,966, Jun. 7, 1993, Pat. No. 5,348,196. This application Apr. 29, 1994, Ser. No. 235,098

Int. Cl.[6] B65D *35/28*

U.S. Cl. 222—95 **21 Claims**



1. A dispensing container, comprising:

at least one peripheral side wall;

a plunger located at a first end of said at least one side wall, said plunger having an outer periphery in close sliding contact with an interior face of said side wall and being capable of movement toward a second end of said side wall, said plunger including a transition portion extending from a center portion radially outward toward said interior face of the side wall and downward toward said first end;

a cap located at a second end of said side wall and including an opening for the contents of the container to pass therethrough during said movement of said plunger;

a flexible bag having a flexible bottom and flexible sidewall defining, and an opening leading to, a closed cavity defined therein, at least a portion of said bag being located within said at least one peripheral side wall; and

a fold confining area located between said transition portion and the interior face of said side wall, said transition portion confining folds of the bag to said fold confining area as the plunger is moved toward said second end.

5,487,492

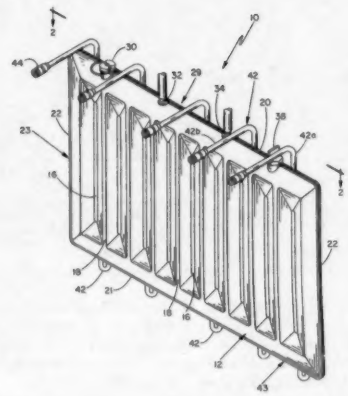
ICE COOLED BEVERAGE DISPENSER HAVING AN INTEGRAL CARBONATOR

Douglas P. Goulet, Big Lake, Minn., assignor to IMI Cornelius Inc., Anoka, Minn.

Continuation of Ser. No. 29,073, Mar. 10, 1993, Pat. No. 5,368,198, which is a continuation-in-part of Ser. No. 936,153, Aug. 26, 1992, abandoned. This application Nov. 15, 1994, Ser. No. 339,849

Int. Cl.[6] B67D *5/00*

U.S. Cl. 222—129.1 **11 Claims**



1. An ice cooled beverage dispenser comprising:

a cold plate, the cold plate being L-shaped and having a horizontal portion and a vertical portion, the cold plate for cooling beverage fluids by heat exchange with ice, the beverage fluids flowing through beverage lines extending through the cold plate from beverage sources to one or more beverage dispensing means, a bin liner comprising a U-shaped wall segment secured to and extending upward from and around a perimeter edge of the cold plate horizontal portion, and the bin liner having opposing vertical edges for securing to opposing end edges of the cold plate vertical portion whereby the bin liner and the cold plate define an ice retaining volume, and

a carbonator, the carbonator having a first side, and a second side, and the first and second sides being substantially planar with co-extensive surface areas wherein common perimeter edges thereof are joined to form a carbonator perimeter edge, and the first side closely spaced from the second side defining a width dimension wherein the carbonator comprises a substantially flat container wherein length and height dimensions of the first and second sides are substantially greater than the width dimension, and the carbonator having an interior volume defined by the first and second sides and the carbonator perimeter edge, and the carbonator having a gas inlet fitting for connecting the internal volume thereof to a source of carbon dioxide gas, a water inlet fitting for connecting the carbonator internal volume to a source of potable water, and one or more carbonated water outlet fittings for providing connection from the carbonator interior volume to the one or more beverage dispensing means, and the carbonator held within the cold plate vertical portion.

5,487,493

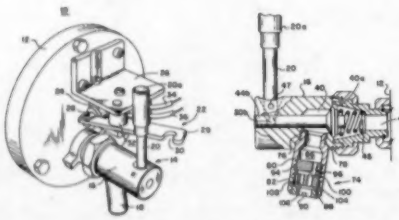
FROZEN BEVERAGE DISPENSING APPARATUS

Rex P. McNabb, P.O. Box 460879, Garland, Tex. 75046

Filed May 23, 1994, Ser. No. 247,236

Int. Cl.[6] B67D *5/32*

U.S. Cl. 222—153.14 **22 Claims**



1. Apparatus for dispensing material in at least a partially frozen state, said apparatus having a container for storing the material under pressure and a valve mounted with the container for controlling the dispensing of the material, said valve including a valve body with a bore communicating with the interior of the container, closure means disposed in the bore and being adapted to close the bore to prevent the material from passing therethrough when the closure means is in a first position, and actuating means for moving the closure means to a second position whereby the material is allowed to pass through the bore, the closure means being nor-

mally in said first position, a portion of the actuating means being external to the valve body, the improvement comprising securing means for automatically engaging said external portion of said actuating means in response to a predetermined condition to prevent said actuating means from being able to move said closure means to said second position, whereby said closure means is secured in said first position to prevent the material from being dispensed.

9. Apparatus for dispensing material in at least a partially frozen state, said apparatus comprising:

a container for storing the material under pressure;

a valve mounted with said container for controlling the dispensing of the material, said valve having a valve body with a bore communicating with the interior of said container, closure means disposed in said bore and being adapted to close the bore to prevent the material from passing therethrough when the closure means is in a first position, and actuating means for moving said closure means to a second position, whereby the material is allowed to pass through the bore, said closure means being normally in said first position; and

diffusion means mounted with said valve body, said diffusion means having a conduit with an internal passageway communicating with said bore, the material being allowed to pass through said bore for being dispensed through said conduit when said closure means is in said second position, said diffusion means further including a diffusion member for diffusing the material generally outwardly from a central longitudinal axis of said conduit and downwardly, the central longitudinal axis of said conduit being oriented generally transversely relative to a longitudinal axis of said bore.

5,487,494

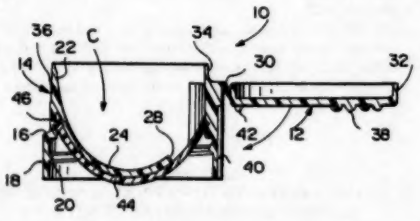
DISPENSING CAP WITH INTERNAL MEASURING CHAMBER AND SELECTIVELY USEABLE SIFTER

Edward S. Robbins, III, 2802 E. Avalon Ave., Muscle Shoals, Ala. 35661

Continuation-in-part of Ser. No. 288,896, Aug. 10, 1994, which is a continuation of Ser. No. 47,086, Apr. 16, 1993, abandoned, which is a continuation-in-part of Ser. No. 237,336, May 3, 1994, Pat. No. 5,465,871, which is a continuation of Ser. No. 979,042, Nov. 19, 1992, abandoned. This application Mar. 31, 1994, Ser. No. 220,530

Int. Cl.[6] B67D *5/38*

U.S. Cl. 222—158 **17 Claims**



1. A measuring/dispensing cap adapted for attachment to an open, upper end of a container, the cap comprising first means for enabling an accurately determined amount of container contents to be dispensed from the cap in a first operating mode; second means for enabling substantially unrestricted pouring of container contents through the cap in a second operating mode; and third means for enabling sifting of container contents in either of said first or second modes; wherein said first means includes a weir panel within said cap, said weir panel having a weir aperture defined partly by a straight weir edge in combination with a dispensing door in a closed position; and wherein said second means includes said first means in combination with the dispensing door in an open position; and wherein said third means comprises a sifter disk underlying said weir panel and rotatable relative thereto, said sifter disk formed with a cut out rotatable into alignment with said weir aperture in a first sifter disk position, and a plurality of sifter apertures adjacent said cut out and rotatable into alignment with said weir aperture in a second sifter disk position.

5,487,495

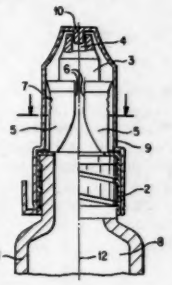
MANUALLY ACTUATED DROPPER

Klaus Derksen, Karlsbad, Germany, assignor to Pohl GmbH & Co. K.G., Karlsruhe, Germany

Filed Apr. 8, 1994, Ser. No. 226,217

Int. Cl.[6] B65D *37/00*

U.S. Cl. 222—209 **10 Claims**



1. A manually actuated dropper device for the mouth of a liquid container, comprising:

an elastically deformable bellows having longitudinal axis and a protruding region, said protruding region of said bellows having a perforation for serving as a dropper opening;

attachment means for sealingly connecting the bellows to the mouth of a container; and

two spring tongues connected to said attachment means, said spring tongues

being configured to extend at least partially around the bellows and extending substantially parallel to the longitudinal axis of the bellows; said spring tongues having protruding end portions that can be displaced towards each other, thereby deforming the bellows located there between; and

stop surfaces on the ends of the spring tongues, wherein the degree to which the spring tongues can be displaced towards each other is limited to a fixed value by the mutual contact of said stop surfaces;

wherein the spring tongues and the protruding region of the bellows having the perforation project upwordly away from the attachment means.

5,487,496

LEAD DELIVERY SYSTEM FOR CASTING STRAPS IN THE MANUFACTURE AND ASSEMBLY OF LEAD-ACID BATTERIES

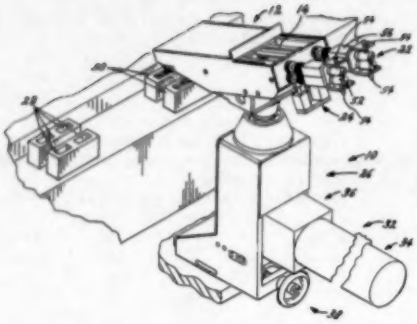
Cory D. Benson, Savage, Minn., assignor to GNB Battery Technologies, Inc., Mendota Heights, Minn.

Filed Aug. 24, 1994, Ser. No. 295,291

Int. Cl.[6] B22D *35/06*

U.S. Cl. 222—593 **10 Claims**

1. An apparatus for delivering molten lead to at least one cast-on-strap mold having a lead delivery position and a wait position comprising a lead delivery member having a lead reservoir sized to hold a volume of molten lead adequate to fill a plurality of cast-on-strap mold cavities, at least one nozzle communicating with said lead reservoir and having an outlet, a valve for each nozzle operable to allow molten lead to be delivered through said outlet of said nozzle when the apparatus is in the lead delivery position and a heater for maintaining the molten lead at a selected temperature, a frame structure for mounting said apparatus to allow said lead supply member to be rotated between the lead



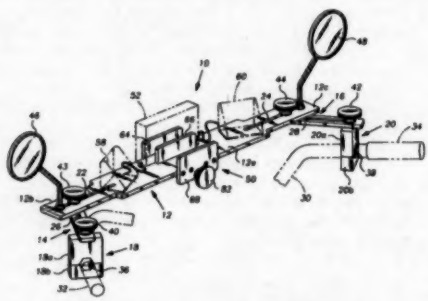
delivery and wait positions about an axis of rotation, means for rotating said lead supply member between the lead delivery and wait positions, said lead reservoir being positioned sufficiently close to the axis of rotation so as to allow movement of said lead delivery member at a selected rate between the lead delivery and wait positions, and the outlet of said nozzle being positioned directly above the cast-on-strap molds when said lead supply member is in the lead delivery position.

5,487,497

BICYCLE HANDLE BAR ACCESSORY MOUNT

Frank P. Kwiatkowski, 311 N. Drake Ave., Fullerton, Calif. 92632

Filed Nov. 21, 1994, Ser. No. 342,894
Int. Cl.[6] B62J *7/06*
U.S. Cl. 224—41 **18 Claims**



1. A handle bar accessory mounting assembly for a vehicle having a handle bar, said assembly comprising:

an elongate generally rigid generally bar-shaped support member having a generally planar upper surface;

an adjustable clamping mechanism on said support member, said mechanism including a fixed member and a movable member for enabling retention of an accessory therebetween on said upper surface;

first and second suspension members;

means on first ends of said suspension members and the distal ends of said support member for adjustably attaching said distal ends of said support member to said first ends of said suspension members, respectively;

means coacting with each of the other ends of said suspension members for mounting said assembly to the handle bar of said vehicle;

said main body portion includes a slot transverse to the longitudinal axis of said support member and said fixed member is a plate attached to a longitudinal edge of said main body portion in perpendicular relation to said transverse slot;

said movable member is configured with a guide tongue portion in sliding engagement within said transverse slot; and

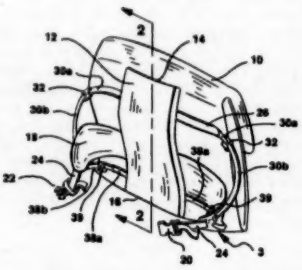
said clamping mechanism includes a manually operable threaded shaft member in threaded engagement with said guide tongue portion for enabling movement of said movable member in response to actuation of said shaft member.

5,487,498

SPORTING PACK WITH APPARATUS FOR CONCENTRATING WEIGHT OF PACK AT LUMBAR REGION OF WEARER

Dana W. Gleason, 409 E. Olive, Bozeman, Mont. 59715

Filed Jul. 27, 1994, Ser. No. 281,437
Int. Cl.[6] A45F *5/00*
U.S. Cl. 224—224 **5 Claims**



1. A sporting pack having an apparatus for transferring weight of the pack to a lumbar region of a wearer, comprising:

a pack;

a lumbar pad having an upper surface and lower surface and attached to the pack at the upper and lower surfaces;

a hip belt positioned between the lumbar pad and the pack for encircling a waist of the wearer;

an elongate, first stay having opposite ends and being disposed between the lumbar pad and the pack and spaced apart from the hip belt, the first stay extending substantially parallel with the hip belt widthwise across the pack and first attachment means coextensive with said first stay for attaching said first stay to said pack, said attachment means having opposite end portions; and

a first pair of strap means connected to each end portion of the first attachment means, respectively, and opposite ends connected to the hip belt, respectively for forcing the stay against the lumbar pad in a direction into the back of the wearer.

5,487,499

SURGICAL APPARATUS FOR APPLYING SURGICAL FASTENERS INCLUDING A COUNTER

Gregory Sorrentino, Wallingford, and Alim Alli, East Norwalk, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 8, 1993, Ser. No. 134,239
Int. Cl.[6] A61B *17/072*
U.S. Cl. 227—175.1 **10 Claims**

1. A surgical apparatus for driving surgical fasteners comprising:

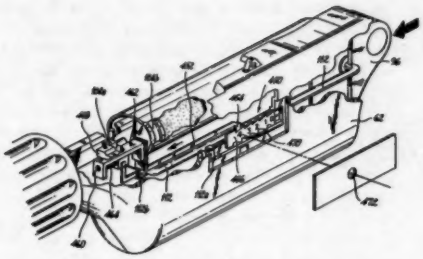
a) a frame portion;

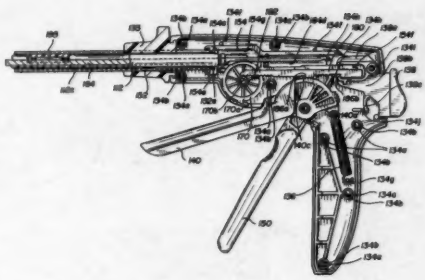
b) an elongated body portion extending from said frame portion;

c) a fastener applying assembly operatively associated with a distal end portion of said body portion and including:

i) a cartridge member having a plurality of surgical fasteners disposed therein; and

ii) an anvil member mounted adjacent said cartridge member against which fasteners ejected from said cartridge member are driven;





d) fastener ejection means actuable from said frame portion for ejecting said plurality of surgical fasteners from said cartridge assembly;

e) a pneumatic actuation system disposed within said frame portion and operatively associated with said fastener ejection means;

f) a trigger operatively associated with said frame portion for actuating said pneumatic actuation system; and

g) counter means for indicating to a user the number of times said pneumatic actuation system may be operated, said counter means being adapted and configured to inhibit the actuation of said trigger after said apparatus has been operated a predetermined number of times.

6. A surgical apparatus for driving surgical fasteners comprising:

a) a frame portion;

b) an elongated body portion extending distally from said frame portion;

c) a fastener applying assembly operatively associated with a distal end portion of said body portion and including:

i) a cartridge member having a plurality of surgical fasteners disposed therein; and

ii) an anvil member mounted adjacent said cartridge member against which said fasteners are driven when ejected from said cartridge member;

d) fastener ejection means actuable from said frame portion for sequentially ejecting said plurality of surgical fasteners from said cartridge assembly;

e) a pneumatic actuation system disposed within said frame portion and operatively associated with said fastener ejection means, said pneumatic actuation system including a longitudinally translating piston member; and

f) counter means for indicating to a user the number of times said pneumatic actuation system may be operated, said counter means being configured to interact with said piston member as said piston member translates longitudinally within said frame portion;

g) means operatively associated with said counter means for inhibiting the operation of said pneumatic actuation system after said apparatus has been operated a predetermined number of times.

5,487,500

SURGICAL STAPLER INSTRUMENT

Bryan D. Knodel; Bennie Thompson, both of Cincinnati, and Richard P. Nuchols, Loveland, all of Ohio, assignors to Ethicon Endo-Surgery, Inc., N.J.

Continuation-in-part of Ser. No. 191,412, Feb. 3, 1994. This application Apr. 29, 1994, Ser. No. 235,070

Int. Cl.[6] A61B *17/068*

U.S. Cl. 227—181.1 **7 Claims**

1. A surgical instrument comprising:

a handle portion;

a tissue enclosing portion having first and second implements capable of performing a function during a surgical procedure;

a reciprocating section adapted to move back and forth along an axis of said implement portion, said reciprocating section including a work portion capable of causing said first and second implements to perform said function;

a drive member;

a movable actuator associated with said handle portion which when engaged with said drive member causes said drive member to move back and forth along said implement portion;

a tissue clamping actuator for causing tissue to be clamped between said first and second implements; and

means on said tissue clamping member for preventing said drive member with said movable actuator if the thickness of the tissue clamped between said first and second implements does not fall within a predetermined range; and

wherein said implement portion comprises:

a staple cartridge having a plurality of staples and at least one slot for receiving a distal end of said work portion, said staple cartridge defining said first implement;

an elongated channel extending from said handle portion and having a distal end which is adapted to receive said staple cartridge;

an anvil mounted on said elongated channel for pivotable movement toward and away from said cartridge, said anvil defining said second implement;

said work portion causing said staples to fire toward said anvil upon movement of said distal end of said work portion into said cartridge;

a closure tube having distal and proximal ends, said distal end of said closure tube being adapted to engage said anvil for effecting pivotable movement of said anvil;

a closure trigger having a handle section and a gear segment section; and,

a closure yoke having distal and proximal ends said distal end of said yoke being connected to said proximal end of said closure tube and said proximal end of said yoke having a gear rack which is adapted to engage said gear segment section such that movement of said closure trigger effects movement of said closure tube.

5,487,501

SHOCK ABSORBER COMPONENT FOR RAILWAY TRACK HAVING POUROUS RUBBER PARTICLE CORE ENCLOSED BY COVER LAYER

Wilhelm Engst; Alexander Repczuk, both of Köln, and Horst Weller, Bad Berleburg, all of, Germany, assignors to Clouth Gummiwerke Aktiengesellschaft, Köln, Germany

PCT No. PCT/DE92/00541, § 371 Date Jan. 10, 1994, § 102(e) Date Jan. 10, 1994, PCT Pub. No. WO93/01355, PCT Pub. Date Jan. 21, 1993

PCT Filed Jun. 30, 1992, Ser. No. 178,270

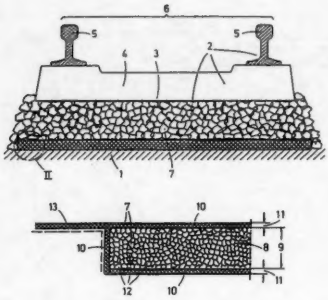
Claims priority, application Germany, Jul. 9, 1991, 41 22 682.8

Int. Cl.[6] E01B *1/00*

U.S. Cl. 238—2 **12 Claims**

1. A shock absorber component in the form of a strip, plate, or mat which can be laid flat on a bed for supporting a superstructure, the shock absorber component comprising:

a core layer made up only of porous rubber particles bonded to each other;



a cover layer surrounding said core layer;

said cover layer being directly vulcanized to said core layer and being made of a compact rubber material;

a plurality of said components are placed one next to the other so that each two mutually adjoining components conjointly define an abutting interface; and, the cover layer of each of said components having a projection which covers the abutting interface; and,

said core layer having an upper surface, a lower surface, and side surfaces; said cover layer including a top portion covering said upper surface; and, said projection being a flange extension of said top portion extending laterally beyond said core layer at one of said side surfaces.

5,487,502

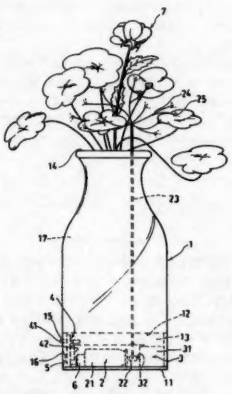
DECORATIVE MEANS FOR EMITTING ODOR AND GENERATING SOUND

Ming-Kang Liao, c/o Hung Hsing Patent Service Center, P.O. Box 55-1670, Taipei, Taiwan, Prov. of China

Filed Jul. 25, 1994, Ser. No. 280,086

Int. Cl.[6] A61L *9/04*

U.S. Cl. 239—69 **1 Claim**



1. A decorative means comprising:

a main body having a decorative article held in said main body;

an odor distributing means mounted in said main body and having a container filled therein with a compressed fluid capable of producing odors and a discharge pipe connected to said container for emitting the compressed fluid towards said decorative article,

a releasing valve in communication with said pipe for valving the fluid to said decorative article;

a driving means including: a solenoid switch mounted in the main body, a driving latch slidably held in an electromagnetic coil electrically connected to a control circuit of a control means, a restoring spring retained in the solenoid switch and normally tensioning the latch rearwardly, the electromagnetic coil operatively attracting the latch electromagnetically forwardly to depress and open the releasing valve of the container to emit the compressed fluid to be sprayed outwardly through at least one nozzle connected to said discharge pipe;

said control means electrically connected with a power source for powering said driving means for controlling the opening and closing of said releasing valve; and

a sound generating means electrically connected with said control means and mounted in combination with said driving means in said main body, whereby upon triggering of said control means, said driving means will be actuated to open said releasing valve of said container for emitting the compressed fluid onto said decorative article for producing odor thereon, and said sound generating means will be simultaneously actuated for producing sound therefrom; the improvement which comprises:

said odor distributing means including a plurality of capillary tubes divergently distributed from an upper end of the discharge pipe and protruding outwardly from the discharge pipe to be disposed in a wide area within the decorative article, and a plurality of nozzles, each said nozzle at one end of each said capillary tube and having a plurality of spraying perforations drilled in each said nozzle for spraying fluid outwardly as emitted from said container upon opening of the releasing valve.

5,487,503

WRAPPED ARTICLE WITH TEAR SLITS

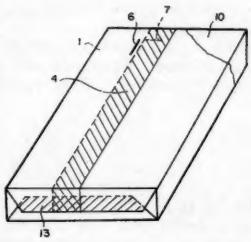
Makoto Sato; Takayoshi Ose, and Satoshi Aramaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 11, 1994, Ser. No. 208,817

Claims priority, application Japan, Mar. 12, 1993, 5-010749 U; Apr. 1, 1993, 5-016103 U; Apr. 1, 1993, 5-016106 U; Jun. 21, 1993, 5-033053 U

Int. Cl.[6] B65D *65/30;85/677*

U.S. Cl. 229—87.05 **17 Claims**



1. An article is covered with a wrapping film, and a body seal section is made by making both ends of the wrapping film overlap with each other and bonding them together, the improvement comprising:

a first slit formed, substantially parallel to both the edge of a lower section of film and the body seal section, on the edge of an upper section of the film which is in the body seal section; and

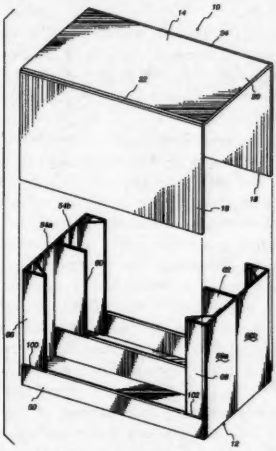
a second slit formed on the periphery of the lower section of the film at a right angle to the first slit in such a manner as to traverse the body seal section.

5,487,504

PAPERBOARD TRAY AND COVER ASSEMBLY

William J. Baird, Indianapolis, Ind., assignor to Inland Container Corporation, Indianapolis, Ind.

Filed Jul. 25, 1994, Ser. No. 279,914
Int. Cl.[6] B65D *25/04*
U.S. Cl. 229—120.17 **21 Claims**



1. A tray of paperboard material made from an integral, one-piece blank, comprising:

a floor having a midportion formed of at least two layers folded against one another to form an upstanding divider wall, integrally formed with the floor and dividing the floor into two portions;

front and rear walls upwardly extending from opposite ends of the floor;

opposed sidewall panels between the front and rear walls, upwardly extending from the floor, above the front and rear walls;

vertical beam members formed of at least two layers integrally formed with the sidewall panels and folded against one another with a fold line extending upwardly from the floor so as to outwardly extend from the sidewall panels toward one another and cooperating with the sidewall panels to form sidewalls of generally T-shaped cross section, the folded portions extending upwardly from the floor along the sidewall panels; and

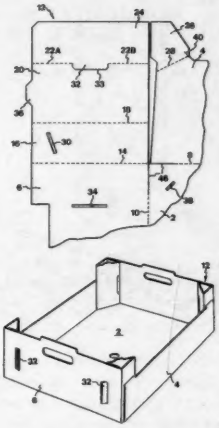
the vertical beam members located at opposing ends of the divider wall.

5,487,505

ARRANGEMENT FOR A CARTON

Bo-Arne Nilsson, Mörarp, Sweden, assignor to Björkebo Gåard AB, Morarp, Sweden

PCT No. PCT/SE93/00377, § 371 Date Dec. 7, 1994, § 102(e) Date Dec. 7, 1994, PCT Pub. No. WO93/22206, PCT Pub. Date Nov. 11, 1993
PCT Filed Apr. 29, 1993, Ser. No. 325,359
Claims priority, application Sweden, Apr. 29, 1992, 9201365
Int. Cl.[6] B65D *5/30;21/032*
U.S. Cl. 229—191 **18 Claims**



1. An arrangement for a box in the form of a flat blank when in an initial position of the box, said arrangement comprising a bottom (**2**), a pair of first side walls and a pair of second side walls (**4**, **6**), each side wall of each pair of said side walls being respectively connected to the bottom (**2**) via fold lines (**8**, **10**) and being substantially vertical when erected, a plurality of substantially parallel panels connected to each of one pair of said side walls (**4**, **6**), wherein a first flap (**32**) is formed by a second panel (**20**) of said plurality of substantially parallel panels, the second panel being connected to a first inner panel (**16**) of said plurality of substantially parallel panels by a second fold line (**18**), the first inner panel being connected to each of the one pair of said side walls (**4**,**6**) by an inner fold line (**14**), wherein the second panel has a width along the longitudinal length of said plurality of substantially parallel panels greater than the first inner panel of said plurality of substantially parallel panels, and wherein a first slot (**34**) is formed in each of the one pair of said side walls (**4**, **6**) connected to the first inner panel (**16**), said first slot (**34**) engaging the first flap (**32**) when the box is erected, wherein a second flap (**26**) is formed at an upper edge of another pair of said side walls (**4**, **6**), and that a second slot (**30**) provided in the inner panel (**16**) to allow the second flap (**26**), after being bent along a fold line (**28**), to be connected to said second slot (**30**), wherein a triangular column is formed at each of four corners of an erected box by one side wall of each pair of said side walls (**4**, **6**) and the second panel.

5,487,506

EASY-OPEN CONTAINER HAVING AN IMPROVED REINFORCING AND TEAR STRIP

Michael T. Drummond, Florence; Calvin G. Hill, Hartsville; Richard M. Lowman, Jr., Hartsville; William C. Suski, Hartsville, all of S.C.; Rodney W. Roberts, Otisco, Ind., and James W. Lowry, Florence, S.C., assignors to Sonoco Products Company, Hartsville, S.C.

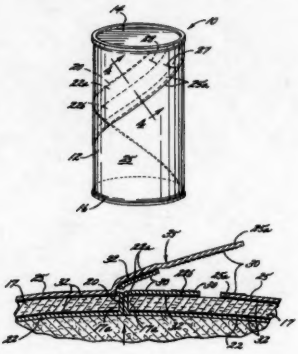
Filed Jun. 22, 1994, Ser. No. 263,556
Int. Cl.[6] B65D *85/00*
U.S. Cl. 229—202 **13 Claims**

1. An easy-open container particularly adapted for packaging products under pressure and comprising:

a spirally-wound paperboard bodywall layer in strip form defining a substantially cylindrical container having opposed ends, said bodywall layer having longitudinal edges lying adjacent each other to thereby define an easy-open spiral seam extending between said opposed ends;

a flexible barrier liner layer in strip form spirally-wound inside said bodywall layer in superimposed position therewith and being wider than said bodywall layer to define longitudinal edge portion means on each side thereof which extend transversely beyond said bodywall layer side edges; said liner edge portion means extending through and out of said easy-open spiral seam and positioned on the outside of said bodywall layer in folded-over superimposed position therewith;

a flexible label layer in strip form spirally-wound outside said bodywall layer and said folded-over liner edge portion means



in superimposed position therewith and having longitudinal edge portions overlapped with each other, said label layer being positioned in bridging relation to said easy-open spiral seam and said folded-over liner layer edge portion means;

a tab cut extending through the upper of said label layer edge portions and inwardly thereof to generally the outer edge of said folded-over liner layer edge portion mean to define a tear tab to be used in easy-opening of said container; and

low strength bonding means positioned between said overlapped label layer edge portions, and high strength bonding means positioned between said superimposed label layer and folded-over liner layer edge portion means and between said superimposed label layer and bodywall layer for creating a reinforcing and tear strip extending from said tear tab along said easy-open spiral seam and between the outer edge of the uppermost of said overlapped label layer edge portions and said easy-open spiral seam and which includes the portion of the uppermost of said overlapped label layer edge portions and said folded-over liner layer edge portion means bonded thereto by said high strength bonding means.

5,487,507

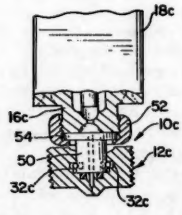
QUICK RELEASE AND CONNECT NOZZLE ASSEMBLY

Daniel P. McDonald, Arlington Heights, Ill., and John P. Smitherman, Salinas, Calif., assignors to Illinois Tool Works Inc., Glenview, Ill.

Continuation of Ser. No. 119,309, Sep. 13, 1993, abandoned. This application Dec. 16, 1994, Ser. No. 358,047

Int. Cl.[6] B05B *15/06*

U.S. Cl. 239—391 **19 Claims**



1. A quick release and connect nozzle assembly for used with a material dispensing head, comprising:

nozzle engagement means disposed upon a portion of said dispensing head and comprising a pair of diametrically opposed, radially outwardly projecting pins having a predetermined axial thickness;

a nozzle member having an aperture defined therethrough for fluidic communication with said dispensing head so as to provide dispensing of a material in a predetermined pattern;

an annular recess defined within an interior end wall of said nozzle member;

a compressible O-ring disposed within said annular recess defined within said interior end wall of said nozzle member and having a portion thereof projecting outwardly from said annular recess defined within said interior end wall of said nozzle member;

connecting means integral with said nozzle member for engagement with said dispensing head projecting pins and comprising a pair of diametrically opposed entry slots defined at a first axial entrance position of said nozzle member; a pair of diametrically opposed terminal end channels, having an axial depth which is greater than said axial thickness of said radially outwardly projecting pins of said dispensing head, defined at a second axial position of said nozzle member which is axially spaced from said first axial position of said nozzle member at which said entry slots of said nozzle member are defined; and a pair of diametrically opposed, semi-circular tracks defined upon interior peripheral wall surfaces of said nozzle member and interconnecting said pair of diametrically opposed entry slots defined at said first axial entrance position and said pair of diametrically opposed terminal end channels defined at said second axial position such that a terminal end channel connected to a first one of said pair of semicircular tracks is disposed axially beneath an entry slot connected to a second one of said pair of semi-circular tracks; said diametrically opposed entry slots defined at said first axial entrance position having a predetermined axial depth which is substantially equal to said predetermined axial thickness of said diametrically opposed, radially outwardly projecting pins of said nozzle engagement means such that upon insertion of said diametrically opposed projecting pins of said nozzle engagement means into said entry slots of said nozzle member, immediate rotation of said nozzle member relative to said dispensing head will cause said nozzle member to be axially translated toward said dispensing head as a result of said diametrically opposed projecting pins of said nozzle engagement means moving circumferentially within said semi-circular tracks of said nozzle member from said first axial entrance position to said second axial terminal position, and said axial translation of said nozzle member toward said dispensing head will cause an end wall of said dispensing head to compress said outwardly projecting portion of said compressible O-ring disposed within said annular recess defined within said interior end wall of said nozzle member such that said nozzle member will be securely mounted upon said dispensing head as a result of said diametrically opposed projecting pins of said dispensing head having travelled through said semicircular tracks of said nozzle member so as to be disposed beneath said axial entrance entry slots, as well as said nozzle member being biased away from said dispensing head whereby said diametrically opposed projecting pins of said dispensing head will be disposed within portions of said terminal end channels of said nozzle member which are closest to said entry slots of said nozzle member so that said nozzle member is axially locked upon said dispensing head without axial play.

5,487,508

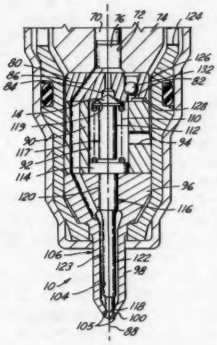
INJECTION RATE SHAPING CONTROL PORTED CHECK STOP FOR A FUEL INJECTION NOZZLE

Lianghe Zuo, Normal, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Continuation of Ser. No. 220,854, Mar. 31, 1994, abandoned. This application Jan. 31, 1995, Ser. No. 380,930

Int. Cl.[6] F02M *45/04*

U.S. Cl. 239—533.5 **6 Claims**



1. A nozzle and tip assembly adapted for a fuel injector comprising:

a needle housing defining an internal cavity and at least one spray orifice;

a movable check disposed in the internal cavity and operably blocking at least one spray orifice;

a stop fixed relative to the housing defining a control port; and

a rate shaping valve disposed between the check and the stop and reciprocal between a first position wherein the valve is seated in the control port thereby limiting check travel and a second position wherein the valve is spaced from the control port permitting fuel flow therethrough, thereby decreasing a quantity of fuel injected through the at least one orifice early in an injection cycle.

5,487,509

CRUSHER AND A CRUSHING MECHANISM FOR THE SAME

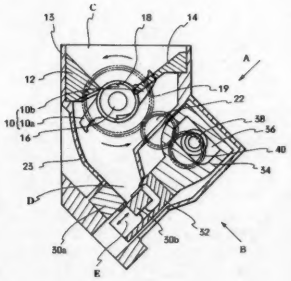
Tomio Hama, Ina, Japan, assignor to Kabushiki Kaisha Harmo Souken, Nagano, Japan

Filed May 23, 1994, Ser. No. 247,847

Claims priority, application Japan, May 27, 1993, 5-126033; May 27, 1993, 5-126034

Int. Cl.[6] B02C *9/04; 1/00*

U.S. Cl. 241—152.2 **11 Claims**



1. A crusher, comprising:

a fixed member having a first blade portion for crushing a material to be crushed into pieces;

a movable member being capable of moving to and away from said fixed member, said movable member having a second blade portion, which crushes the material into pieces with said first blade portion when said movable member is moved toward said fixed member;

a driving mechanism for moving said movable member to and away from said fixed member; and

a preparatory crushing section which includes a rotary blade member, wherein the material is preparatorily crushed by said preparatory crushing section and introduced to said fixed member and said movable member.

5,487,510

APPARATUS FOR PREPARING RUBBER SCRAP FOR RECYCLING

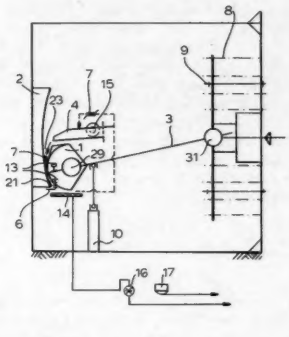
Stefan Ficker, Munich, Germany, assignor to Ingenieurburo S. Ficker Verfahrenstechnik, Munich, Germany

Filed Mar. 22, 1994, Ser. No. 215,916

Claims priority, application Germany, Apr. 1, 1993, 43 10 689.7

Int. Cl.[6] B02C *19/08*

U.S. Cl. 241—199.6 **13 Claims**



1. An apparatus for treating rubber particles having textile and/or metallic inclusions, the apparatus comprising:

a nonsmooth support surface;

a press body having a nonsmooth surface juxtaposed with the support surface, forming with the support surface a gap flaring opposite to a feed direction, and displaceable transverse and parallel to the support surface;

feed means for continuously feeding the particles in the feed direction to the gap;

first actuator means for pressing the particles against the support surface in a direction transverse to the support surface with the press-body surface at a pressure of in excess of 10 kg/cm^2; and

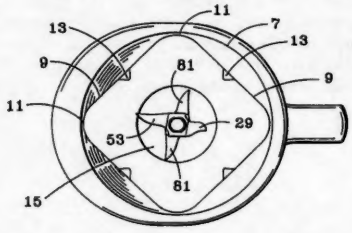
second actuator means for relatively displacing the support surface and the press body in a direction generally parallel to the support surface and to the feed direction and thereby subjecting the particles to shear to separate the inclusions from the rubber of the particles.

5,487,511

BLENDER BLADES AND SYSTEM ADAPTED FOR ICE CRUSHING

Arthur J. Sansone, Stamford, Conn., and Asik Braginsky, Forest Hills, N.Y., assignors to Conair Corporation, Stamford, Conn.

Filed Aug. 12, 1994, Ser. No. 289,427
Int. Cl.[6] B02C *18/12;18/20*
U.S. Cl. 241—282.1 **12 Claims**



1. A set of blades for use in a blender, said blender including a jar, a base, and an associated motor, said set of blades including

a pair of upwardly-extending blades, including a first upwardly-extending blade and a second upwardly-extending blade, said pair having a common first base and a first axis of rotation perpendicular to said common first base, said blades being of substantially the same shape and configuration, and said first upwardly-extending blade being at a lesser angle relative to said first axis than the angle of said second upwardly-extending blade relative to said first axis, whereby said first upwardly-extending blade extends further in the direction of said first axis than said second upwardly-extending blade,

each of said upwardly-extending blades having a leading edge and each said leading edge being of involute shape with a convex portion and a concave portion,

a pair of downwardly-extending blades, including a first downwardly-extending blade and a second downwardly-extending blade, said pair of downwardly-extending blades having a common second base and a second axis of rotation perpendicular to said common second base, and

said pair of upwardly-extending blades and said pair of downwardly-extending base being mounted together for common rotation with said first axis and said second axis in alignment with one another.

5,487,512

TAKE-UP APPARATUS FOR AND PACKAGE OF TAPE TYPE NON-TWISTED CARBON FIBER BUNDLE

Hironobu Nojiri; Kazuyuki Yakushiji, both of Ehime; Minoru Yoshinaga, Yokohama, and Hiroyuki Terasaka, Ohtsu, all of, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 944,736, Sep. 14, 1992, which is a continuation of Ser. No. 722,539, May 20, 1991. This application Mar. 17, 1994, Ser. No. 214,181
Claims priority, application Japan, May 21, 1990, 2-131912
Int. Cl.[6] B65H *18/08;54/00;23/02*
U.S. Cl. 242—471 **3 Claims**

1. A take-up apparatus for tape type non-twisted carbon fiber bundles consolidated into a sheet by a resin composition, comprising:

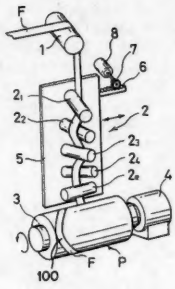
guide rollers adapted to first receive said carbon fiber bundles from a fiber bundle supply source;

a bobbin adapted to take up therearound said carbon fiber bundles sent out from said guide roller structure;

a driving means for rotating said bobbin; and

a traverse drive unit adapted to traverse said guide roller structure and said bobbin reciprocatingly and relatively to each other in parallel with the axial direction of said bobbin,

said guide roller structure including



an introduction guide roller in cylinder shape disposed so that an angle θ_1 between an axial direction of said introduction guide roller and an axial direction of said bobbin is substantially 90°,

a final guide roller in cylinder shape disposed so that an angle θ_e between an axial direction of the final guide roller and the axial direction of said bobbin is in a range from −15° to +5°, and

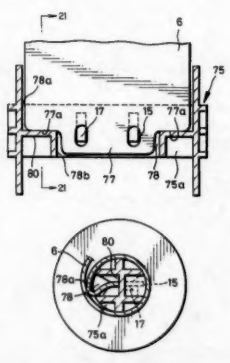
a plurality of intermediate guide rollers in cylinder shape disposed between said introduction guide roller and said final guide roller so that an angle difference between one intermediate guide roller and an adjacent guide roller is not more than 45°.

5,487,513

PHOTOGRAPHIC FILM CASSETTE MACHINE WITH FILM ANCHORING DEVICE

Koichi Takahashi; Hiroshi Kataoka; Haruo Ichikawa; Tetsuya Takatori, and Toshiharu Naito, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 791,285, Nov. 13, 1991, abandoned. This application Feb. 16, 1994, Ser. No. 197,455
Claims priority, application Japan, Nov. 13, 1990, 2-306533; Feb. 4, 1991, 3-035732
Int. Cl.[6] G03B *23/02*
U.S. Cl. 242—348.1 **6 Claims**



1. A photographic film cassette wherein a spool, with photographic film wound thereon, is rotatably contained in a cassette shell, and rotation of said spool propels a film leader to an outside of said cassette shell, compromising:

a slit formed in a core of said spool for receiving a film trailer portion of said photographic film, said slit having a shape which corresponds to the shape of said film trailer portion to conform to said film trailer portion, an entrance portion of said slit having a width which is substantially equal to a maximum width of said photographic film;

at least one anchoring hole formed in said film trailer portion;

at least one anchoring claw projecting from a first inside surface of said slit so as to engage with said anchoring hole; and

at least one pressing projection projecting from a second inside surface of said slit, and extending toward said first inside surface, so as to press said film trailer portion toward said anchoring claw and prevent said anchoring hole from disengaging from said anchoring claw wherein said entrance portion of said slit extends in a direction of an axis of rotation of said spool core, said entrance portion receives said film trailer portion across the maximum width of said photographic film; and

an abutment positioned inside of said slit so as to abut said film trailer portion.

5,487,514

Patent Not Issued For This Number

5,487,515

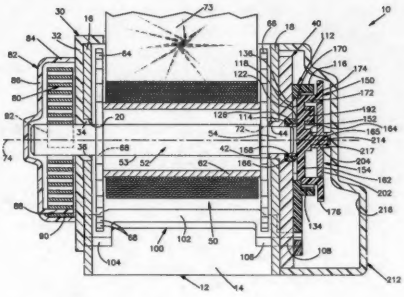
SEAT BELT RETRACTOR WITH LOCK BAR ACTUATOR

Michael K. Hishon, New Baltimore, and Steven Stoll, Mt. Clemens, both of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Nov. 23, 1993, Ser. No. 156,583

Int. Cl.[6] B60R *22/405*

U.S. Cl. 242—383.4 **28 Claims**



1. Apparatus comprising:

a frame;

a spool supported for rotation on said frame;

locking means for blocking rotation of said spool when said locking mean is actuated;

an actuator member supported for movement relative to said frame, said actuator member having means for actuating said locking means upon movement of said actuator member from an unactuated position to an actuated position; and

means for moving said actuator member from said unactuated position to an actuated position;

said actuator member including spring means for resisting movement of said actuator member relative to said frame, said actuator member having a first portion supported for movement relative to said frame, said first portion of said actuator member defining said unactuated and actuated positions, said actuator member further having a second portion which is fixed relative to said frame, said spring means resisting movement of said first portion relative to said second portion.

5,487,516

TRAIN CONTROL SYSTEM

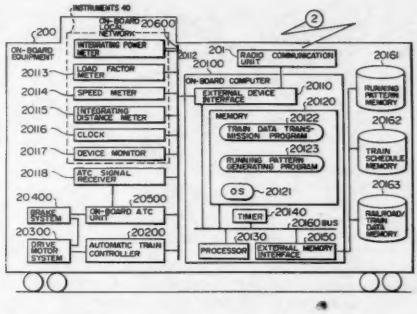
Satoru Murata; Atsushi Kawabata; Shuuichi Miura; Korefumi Tashiro; Yasuo Morooka; Masakazu Yahiro; Masaki Katahira, and Kazuo Kera, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 15, 1994, Ser. No. 213,358

Claims priority, application Japan, Mar. 17, 1993, 5-056750

Int. Cl.[6] B61L *27/00*

U.S. Cl. 246—182 C **19 Claims**



17. A train control system, comprising:

means, remote from a plurality of trains, for generating aimed target information including position and time for a given train in the system on the basis of said given train's operation schedule and optimal interspacing between all trains;

means on said given train for generating an operation curve based on the generated aimed target information;

a train controller responding to said operation curve and controlling the operation of the train; and

means for communicating between said means for generating aimed target information and said means for generating the operation curve;

wherein:

said means for generating aimed target information calculates possible run regions of plural trains to arrive at said aimed target;

run fault between trains is detected from said possible run regions of plural trains; and

said aimed target information is renewed or added with other aimed target information to remove said run fault when said run fault was detected.

5,487,517

REMOVABLE HANGER

Harold C. Smith, 1101 Birchcrest Rd., Bellevue, Nebr. 68005

Continuation-in-part of Ser. No. 77,291, Jun. 15, 1993, Pat. No. 5,395,080. This application Dec. 9, 1994, Ser. No. 353,440

Int. Cl.[6] A47B *96/06*

U.S. Cl. 248—215 **2 Claims**

1. A hanger, comprising:

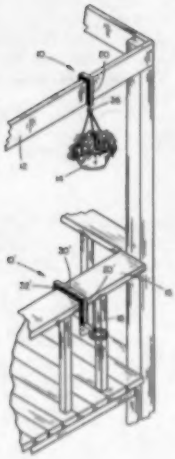
a rigid body having an upper and lower end and forward and rearward surfaces;

said body upper end including a hook portion for removable attachment to a support member;

said hook portion including an arm projecting rearwardly from the upper end of the body, and having upper and lower surfaces, and a leg depending from a rearward end of the arm, and having forward and rearward surfaces and opposing sides;

said arm lower surface and leg forward surface being generally flat and oriented orthogonally;

said leg forward surface having a groove formed therein extending from side to side, with an axis generally parallel to the arm lower surface, for removably receiving a projecting flange of a support member therein; and



support means removably connected to the lower end of the body, for supporting an article on said hanger.

5,487,518

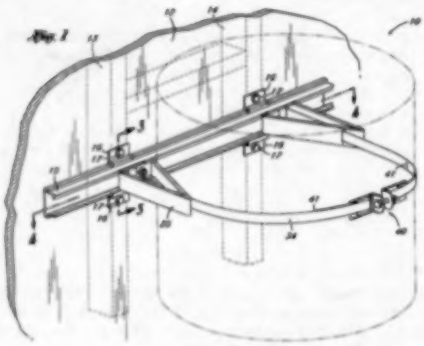
WATER HEATER RESTRAINT

William E. McCraney, 22262 Kittery Cir., Huntington Beach, Calif. 92646, and William J. McCraney, 1918 W. Chestnut St., Santa Ana, Calif. 92703

Filed Feb. 3, 1994, Ser. No. 191,271

Int. Cl.[6] A47K *1/08*

U.S. Cl. 248—225.11 **1 Claim**



1. A water heater restraint for securing a vertical cylindrical water heater adjacent a wall, which wall is supported by a plurality of vertical studs, said restraint comprising:

a bi-channel strut comprising an elongated member having an elongated back portion with a top edge and a bottom edge and having a pair of first channels adjacent said top and bottom edges and a pair of outwardly extending portions adjacent the pair of first channels, said outwardly extending portions each having an outer edge and a pair of second channels formed adjacent the outer edges of said pair of outwardly extending portions, each of said second channels having an inwardly directed elongated flange;

means for securing said hi-channel strut to the studs of a wall;

a pair of triangular gussets each having a base, an inner edge and an outer edge and each gusset being slidably positionable along said pair of second channels and when placed in a desired position with inner edges, each inner edge forming an inner support face which is angled outwardly away from the strut and away from each other, said inner edges facing inwardly having means for securement at the base thereof to said pair of second channels and each of said triangular gussets is formed from an elongated rectangular sheet of metal and the base of each gusset has two overlapping ends of the sheet and the overlapping ends have a hole therein through which a bolt may be passed and said gussets each being held to the second channel by a backer plate held against the inwardly directed elongated flange of the second channel and bolted to the base thereof; and

strapping means for surrounding a water heater and means for securing said strapping means to said pair of triangular gussets and against said elongated strut and wherein said strapping means is a pair of lengths of strapping and each length having an inner end and an outer end and each inner end has a hole therethrough and is secured to the respective bases of the gussets by passing a gusset bolt therethrough and positioning each of the respective inner ends between the base of the gusset and the respective backer plates and wherein each of the inner ends of the two lengths of strapping is passed through a slot in the hypotenuse of each gusset and another slot in the base of each gusset whereby a water heater may be secured to a wall by affixing the bi-channel strut to the wall against which the water heater is to be affixed, sliding the gussets to the outer edges of the water heater and placing the strapping means around the water heater and securing the strapping means to the gussets and the gussets to the bi-channel strut.

5,487,519

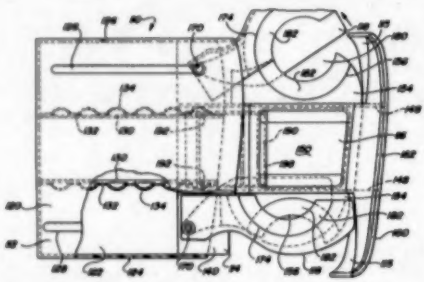
RETRACTABLE BEVERAGE CONTAINER HOLDER

David N. Grabowski, Rochester Hills, Mich., assignor to Chivas Products Limited, Sterling Heights, Mich.

Filed Mar. 26, 1993, Ser. No. 37,319

Int. Cl.[6] A47K *1/08*

U.S. Cl. 248—311.2 **12 Claims**



1. A container holder comprising:

a housing having a top surface and a bottom surface;

a frame disposed between said top and bottom surfaces and slidably mounted to said housing for movement between a retracted position within said housing and an extended position partially spaced apart from said housing, said frame having a first portion defining a central open area, said frame having a second portion defining a first partially circular opening;

a first arm disposed within said frame and having means for supporting a first container in a first direction disposed therein, said first arm defining a second partially circular opening and including a first pivot pin for pivotably mounting said first arm to said frame such that said first arm is movable between a closed position and an open position, said second partially circular opening of said first arm cooperating with

said first partially circular opening of said frame to define a first partially circular aperture when in said open position, said first partially circular aperture operable to receive said first container; and

a first support base pivotably mounted to said frame by said pivot pin, said first support base supporting said first container in a second direction, said second direction being generally perpendicular to said first direction;

wherein said first support base comprises a first cup base pivotably attached by said pivot pin to said frame and operable to move from a raised stored position within said housing when said first arm is in said closed position to a lowered in use position wherein a portion of the first support base extend below said bottom surface of said housing when said first arm is in said open position.

5,487,520

POWER SEAT SLIDE DEVICE

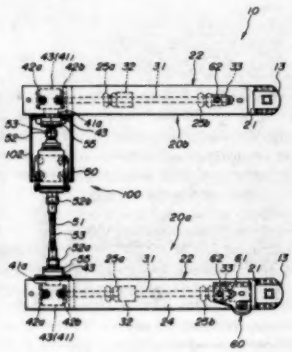
Takayuki Mouri, and Tohru Isomura, both of Ayase, Japan, assignors to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Jun. 10, 1993, Ser. No. 74,444

Claims priority, application Japan, Sep. 25, 1992, 4-067007 U

Int. Cl.[6] F16M *13/00*

U.S. Cl. 248—429 **10 Claims**



1. A power seat slide device comprising:

first and second rail units each including a lower rail secured to a fixed member and an upper rail slidably engaged with the lower rail, the Upper rails of said first and second rail units carrying thereon a seat;

two threaded bolt members respectively incorporated with said first and second rail units, each threaded bolt member being rotatably carried by one of said lower and upper rails through first and second supporting members;

two nut members respectively incorporated with said first and second rail Units, each nut member being connected to the other of said lower and upper rails and meshed with said threaded bolt member so that rotation of said threaded bolt member about its axis induces a longitudinal movement of said upper rail relative to said lower rail;

an electric power device for rotating both the threaded bolt members of said first and second rail units with an aid of electric power;

two first shock absorbing members respectively incorporated with said first and second rail units, each first shock absorbing member being slidably mounted on the threaded bolt member between said first supporting member and said nut member; and

two second shock absorbing members respectively incorporated with said first and second rail units, each second shock absorbing member being slidably mounted on the threaded bolt member between said second supporting member and said nut member,

wherein each of said first and second shock absorbing members comprises an elastomeric material and is shaped like a bobbin including a cylindrical core portion and two circular flange portions formed on front and rear ends of said cylindrical core portion.

5,487,521

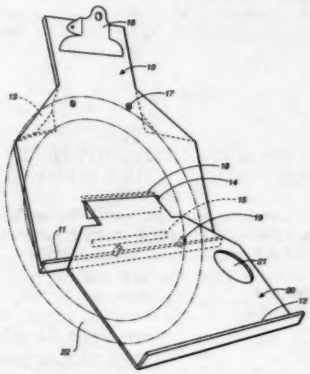
STEERING WHEEL MOUNTED SUPPORT FOR COMPUTER, PRINTED MATTER, FOOD, AND/OR BEVERAGE

Jack D. Callahan, P.O. Box 460442, San Francisco, Calif. 94146-0442

Filed Mar. 15, 1995, Ser. No. 404,319

Int. Cl.[6] A47B *19/00*

U.S. Cl. 248—441.1 **8 Claims**



1. A vehicular mounting assembly releasable attached to a vehicle steering wheel comprising:

a clipboard having a top end, a bottom end, an upper surface and a back surface;

clip means on said clipboard top end for removable retaining printed material against said upper surface;

a planar tray having a top end, a bottom end, an upper surface and a back surface;

affixing means on said tray for removable securing said tray to the clipboard;

adjusting means on said clipboard; wherein said adjusting means cooperates with said affixing means for adjusting the tray at a plurality of angles with respect to the clipboard; and

means for attaching the clipboard to the steering wheel.

5,487,522

MIRROR SUPPORT BRACKET

Richard R. Hook, Hudsonville, Mich., assignor to Donnelly Corporation, Holland, Mich.

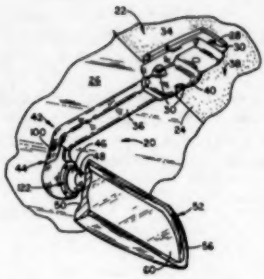
Filed Nov. 30, 1993, Ser. No. 159,838

Int. Cl.[6] F16M *13/00*

U.S. Cl. 248—549 **24 Claims**

1. A single ball joint support bracket for a vehicle rearview mirror housing, the mirror housing having a ball member extending therefrom, comprising:

a mirror stay having a first end terminating in a single, generally spherical, ball joint socket;



a cup, substantially enclosing the ball member extending from the mirror housing, disposed within said generally spherical ball joint socket, and having a rear surface; and

a biasing member disposed in said generally spherical, ball joint socket behind said cup, to force said cup toward one end of said socket and compress about the ball to sustain a substantially constant clamping force on the ball through a range of ambient temperatures, said biasing member including at least one of a disk, rectangular, square, hexagonal, leaf, and coil spring.

5,487,523

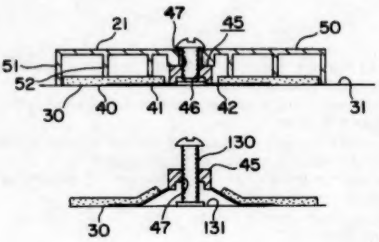
READILY RELOCATABLE SECURITY MOUNT WHICH CAN HOLD ARTICLES WITH A WIDE RANGE OF DIMENSIONS

William D. Ingram, Irvine, Calif., and J. Steven James, Philomath, Oreg., assignors to Ivie Industries, Irvine, Calif.

Filed Aug. 20, 1993, Ser. No. 109,725

Int. Cl.[6] F16M *13/00*

U.S. Cl. 248—551 **5 Claims**



5. A mount for releasably holding a separate article to a surface comprising:

a flexible mat having a first and a second face, said first face bearing adhesive means for attachment to said surface, and said second face bearing no adhesive means, said mat having an opening therethrough;

a flexible metal sheet contiguous to and adherent to said first face and surrounding said opening, and having a post extending through said opening and also having openings therethrough, through which said last-named openings said adhesive means, can contact said surface, said post having a threaded passage extending through said opening in said mat;

a headed bolt threaded into said post, whereby releasably to hold the article to said mat when said mat is adherent to said metal sheet and to said surface, whereby said bolt can further be turned to exert a force against said surface, gradually to release said mat from said surface by exertion of force between said metal plate and said surface.

5,487,524

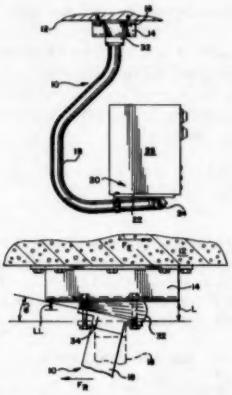
MOUNTING ASSEMBLY WITH FORCED ABSORPTION CHARACTERISTICS

Carl A. Bergetz, River Forest, Ill., assignor to Peerless Industries, Inc., Melrose Park, Ill.

Filed Apr. 21, 1994, Ser. No. 230,893

Int. Cl.[6] F16M *13/00*

U.S. Cl. 248—613 **24 Claims**



1. A mounting assembly for mounting electrical appliances, such as television sets to a building comprising:

mounting means adapted for attachment to a building support surface, an arm member adapted for attachment to the mounting means, the arm member having means for supporting said appliance in a spaced-apart relationship from the building support surface, said mounting assembly including force absorbing means disposed between and in contact with said mounting means and said arm member, whereby said force absorbing means effectively dampens forces imparted upon the building and present in said building support surface, said force absorbing means being a compressible interface member having an axial length sufficient to permit angular articulation of said mounting arm with respect to said mounting means, said mounting means, interface member and mounting arm being held together by at least one fastener member extending therethrough, the fastener member being adjustable so as to permit the application of a preload to said interface member.

5,487,525

ADJUSTABLE KEYBOARD HOLDER FOR WORKSTATIONS

Matthew P. Drabczyk, 10085 St. Vrain Ct., Westminster, Colo. 80231, and Daniel C. Starkey, 4229 S. Cherokee St., Englewood, Colo. 80110

Continuation of Ser. No. 953,453, Sep. 29, 1992, Pat. No. 5,294,087, which is a continuation of Ser. No. 779,378, Oct. 18, 1991, abandoned. This application Mar. 14, 1994, Ser. No. 212,084

Int. Cl.[6] F16M *3/00*

U.S. Cl. 248—639 **7 Claims**

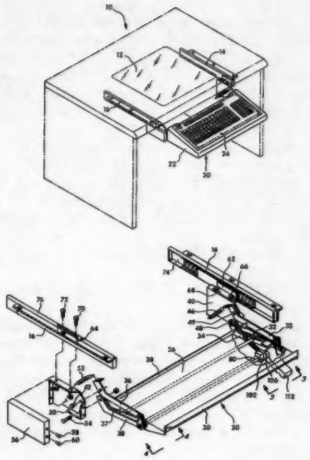
1. An adjustable keyboard holder for a workstation, said adjustable keyboard holder comprises:

a keyboard tray support;

means for mounting said keyboard support to a workstation;

means for infinitely adjusting the angular position of said keyboard tray support within a range of motion relative to the workstation;

means for infinitely adjusting the vertical position of said keyboard tray support within a range of motion relative to the workstation;



means for providing horizontal movement of said keyboard tray support from an operating position extending substantially beyond the edge of the workstation to a storage position substantially beneath the surface of the workstation; and

a single actuating mechanism mounted adjacent said keyboard tray support for releasing said angular adjusting means and said vertical adjusting means for adjustment and for locking said angular adjusting means and said vertical adjusting means in a selected angular and vertical position.

5,487,526

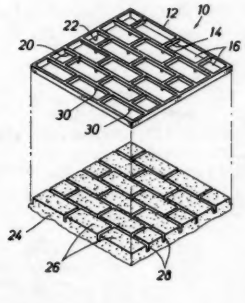
MOLD DEVICE FOR FORMING CONCRETE PATHWAYS

Jack T. Hupp, P.O. Box 1206, Richmond, Tex. 77469

Continuation-in-part of Ser. No. 900,062, Jun. 16, 1992. This application May 6, 1994, Ser. No. 239,045

Int. Cl.[6] E01C *7/00*

U.S. Cl. 249—2 **16 Claims**



1. A mold for forming a concrete surface, comprising:

perimeter sidewalls having top and bottom edges; and

a plurality of interconnecting beams having top and bottom edges;

wherein said sidewalls and said interconnecting beams circumscribe a plurality of openings for forming a concrete slab, the top edges of said sidewalls and said interconnecting beams defining a continuous surface, and wherein said interconnecting beams extend downwardly from said continuous surface a distance less than said sidewalls, and further including at least one support leg downwardly depending from said interconnecting beams.

5,487,527

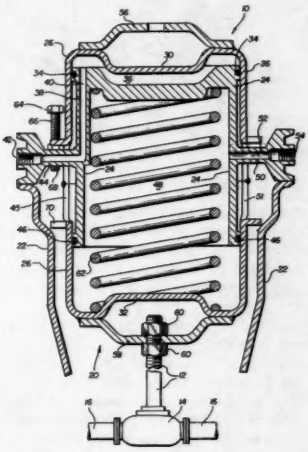
VALVE ACTUATOR

Philip W. Eggleston, Marshalltown, Iowa, assignor to Fisher Controls International, Inc., Clayton, Mo.

Filed Jun. 2, 1994, Ser. No. 252,926

Int. Cl.[6] F16K *31/122*

U.S. Cl. 251—62 **15 Claims**



13. An actuator for operating a control element used to regulate the flow of fluid through a fluid control valve said actuator comprising:

a pair of coaxially aligned members, one externally mounted with respect to the other and axially movable with respect to the other, said members having adjacent ends, wherein a chamber is defined between said adjacent ends for moving said one movable member away from said other member during operation of said actuator;

means for coupling said control element to said one movable member;

means for coupling said chamber to fluid under pressure for operating said actuator and moving said one movable member away from said other member from a first valve actuator position to a second valve actuator position; and

return means for axially moving said one movable member towards said other member from said second valve actuator position to said first valve actuator position.

5,487,528

QUIET APPLIANCE WATER VALVE

James W. Richmond, Carmel, Ind., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 22, 1993, Ser. No. 51,136

Int. Cl.[6] F16K *47/14;31/40;31/385*

U.S. Cl. 251—127 **10 Claims**

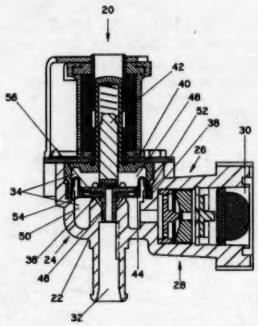
1. An appliance water valve, comprising:

(a) a valve body defining an inlet,, an outlet, and a valving cavity disposed between and communicating with the inlet and the outlet, and a valving surface between the inlet and the outlet;

(b) a main valve moveable to a position away from the valving surface for permitting flow from the inlet through the valving cavity to the outlet, and moveable to a position contacting the valving surface for preventing flow from the inlet through the valving cavity;

(c) a flow control located between the inlet and the valving cavity for providing a substantially constant rate of water flow; and,

(d) means for reducing water flow noise, comprises:



(1) a dispersion chamber having passage holes placed downstream of the flow control which indirectly communicates with a central exit port for radially dispersing and accelerating water to the periphery of the dispersion chamber and into the passage holes decelerating water to decrease inlet water velocity,

(2) a recombining chamber downstream of the dispersion chamber communicating with the dispersion chamber and the valving cavity receiving water from the passage holes in the dispersion chamber to redirect and accelerate all water flow radially from the periphery of the recombining chamber inward toward the central exit port thus causing water flow from opposing directions to converge at the central exit port and decelerate thereby reducing water velocity.

5,487,529

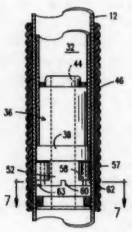
FLOW-THROUGH WASHING AND SCRUBBING BRUSH HANDLE

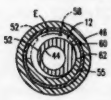
Duane H. Newville, 6242 3rd Ave. S., St. Petersburg, Fla. 33707

Continuation-in-part of Ser. No. 2,652, Jan. 11, 1993, Pat. No. 5,336,012. This application Jul. 7, 1994, Ser. No. 271,599

Int. Cl.[6] **A46B** *11/06;* **A47L** *13/22;* **F16K** *51/00*

U.S. Cl. 251—148 **3 Claims**





1. An improved flow-through washing and scrubbing brush handle, comprising:

an elongated hollow outer tube having a coupling structured for connecting a first end of said outer tube to a pressurized water supply;

an elongated rigid hollow inner tube mounted for slidable rotational and longitudinal movement within said outer tube, a first end of said inner tube extendable beyond a second end of said outer tube and connectable to a flow-through type brush head;

an elongated twist-lock body having a central longitudinal water passage therethrough, a first portion of said twist-lock body connected within a second end of said inner tube positioned within said outer tube;

said twist-lock body having a first sealing ring around the end of said first portion thereof for preventing water passing into said inner tube through said water passage from passing out of said inner tube second end;

a second sealing ring positioned transversely around an end of a second portion of said twist-lock body extending into said outer tube beyond said inner tube second end, said second sealing ring structured for preventing pressurized water entering said outer tube first end from passing between said inner and outer tubes;

said twist lock body second portion having an eccentric cam segment;

a locking collar loosely positioned transversely around said eccentric cam segment;

said locking collar having a generally C-shaped, eccentric construction that includes a pair of circumferentially spaced opposing ends having a first predetermined thickness, and wherein said locking collar gradually thickens, in a radial direction, until it reaches a second predetermined thickness at a preselected point between said opposing ends, said second predetermined thickness being greater than said first predetermined thickness;

a longitudinally extending protrusion formed on said eccentric cam segment;

said locking collar having a circumferentially extending recess formed therein, said recess forming a pair of stop surfaces that are circumferentially spaced further apart from one another than said opposing ends of said locking collar;

said locking collar being wedged against said outer tube when said outer tube is rotated in a first direction;

said locking collar being continuously rotatable with respect to said outer tube when said outer tube is rotated in a second direction opposite to said first direction; and

a stop surface of said locking collar abutting said longitudinally extending protrusion when said outer tube is rotated in said second direction;

said inner and outer tubes locking together when relatively rotated in said first direction and freewheeling in an unlocked configuration when said inner and outer tubes are rotated with respect to one another in said direction opposite to said first direction.

2. The improved flow-through washing and scrubbing brush handle as set forth in claim **1**, further comprising:

means connected to said coupling and positioned within said outer tube first end for adjusting the volume and controlling the flow of water through said outer tube.

5,487,530

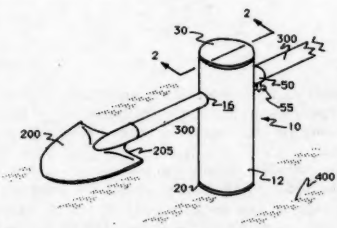
SHOVELING AID

Harold J. McCullough, 16238-56th Avenue, R.R. #10, Surrey. British Columbia, Canada

Filed Feb. 16, 1994, Ser. No. 197,517

Int. Cl.[6] **A01B** *1/02*

U.S. Cl. 254—131.5 **3 Claims**



1. For a shovel comprising a shovel blade and an elongated handle extending away from said blade, a shoveling aid comprising:

(a) an elongated bracing member comprising a pipe section extending from a base end to a top end, said pipe section including upper and lower openings on opposed sides of said pipe section, said upper opening being positioned nearer to said top end than said lower opening; and,

(b) means for attaching said bracing member to said handle at a selected position away from said blade to permit said shovel to be levered with said aid to lift a load carried by said blade, said attaching means comprising:

(i) a sleeve coupled to said pipe section in said upper opening, said sleeve being sized and oriented to longitudinally receive said handle at a predetermined angle relative to said pipe section, said handle being longitudinally receivable through said openings and said sleeve to said selected position; and,

(ii) means for releasably securing said handle in said sleeve at said selected position.

5,487,531

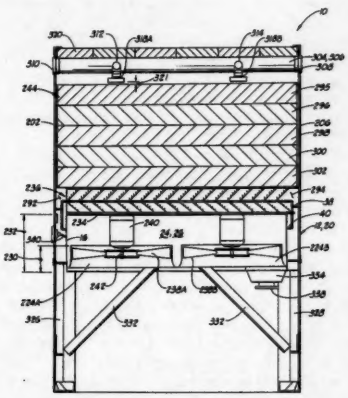
DUAL LAYERED DRAINAGE COLLECTION SYSTEM

Harold D. Curtis, Chickasha, Okla., assignor to Tower Tech, Inc., Chickasha, Okla.

Continuation-in-part of Ser. No. 161,069, Dec. 3, 1993. This application May 10, 1994, Ser. No. 240,280

Int. Cl.[6] B01F *3/04*

U.S. Cl. 261—30 **14 Claims**



2. A cooling tower apparatus, comprising:

a body of fill material;

a liquid distribution system located above said body of fill material for distributing liquid on top of said body of fill material so that said liquid gravitates downward through said body of fill material;

a fan located below said body of fill material for blowing cooling air upward through said body of fill material to contact and cool said liquid;

a dual-layer drainage collection system located between said body of fill material and said fan for collecting said liquid falling from said body of fill material and for preventing said liquid from reaching said fan, said drainage collection system including:

an upper layer of parallel elongated collection plates having a first length, said collection plates being sloped and overlapping in a direction transverse to said first length of said collection plates, said overlapping collection plates covering said fan; and

a lower layer of parallel elongated collection plates located between said upper layer and said fan for collecting overspray from said upper layer and preventing said overspray from reaching said fan;

wherein each of said collection plates of said lower layer is a hollow double-walled plate having an interior and having an upper opening communicated with said interior and located to receive liquid draining downward from one plate of said upper layer into said interior;

a basin laterally surrounding said fan, said basin including first and second parallel gutter means, on opposite sides of said fan, for receiving liquid from said drainage collection system and for directing said liquid into said basin;

said lengths of said collection plates lying generally perpendicular to said first and second gutter means of said basin, with ends of said collection plates being open to drain into said first and second gutter means; and

first and second end caps attached to each of said collection plates of said lower layer having first and second outlets, respectively, defined in said end caps and communicating the interiors of said collection plates of said lower layer with said first and second parallel gutter means, respectively.

5,487,532

DEVICE FOR INSERTING A LANCE INTO A PRESSURIZED CONTAINER, IN PARTICULAR A BLAST FURNACE

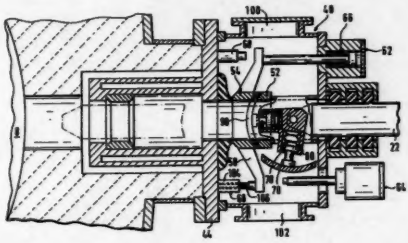
Emile Lonardi, Bascharage; Radomir Andonov, Mamer, and Giovanni Cimenti, Fentange, all of, Luxembourg, assignors to Paul Wurth S.A., Luxembourg

Filed May 26, 1994, Ser. No. 250,754

Claims priority, application Luxembourg, May 27, 1993, 88 280

Int. Cl.[6] C21C *5/48*

U.S. Cl. 266—271 **20 Claims**



1. A device for equipping an opening in a pressurized container for the axial insertion of a lance, the device comprising:

a leaktight casing including:

a first plate intended to be connected to a pressurized container and a second plate spaced from said first plate;

a first through opening in said first plate and a second through opening in said second plate, each of said openings intended for passing therethrough a lance;

sealing means attached to said second plate for establishing axial leaktightness around a lance when a lance is inserted therein;

passage means in said leaktight casing between said first and second through openings for establishing a passage for a lance between said first and second through openings, said passage means having an axis and including;

a first seat connected in a leaktight manner to said second through opening;

a second seat being connected in a leaktight manner to said first through opening, said second seat being arranged opposite said first seat along said axis and being movable along said axis with respect to said first seat;

closure means mounted in the leaktight casing for opening and closing said passage means between said first and second seats, said closure means being movable between a first position in which said closure means is aligned between said first seat and said second seat and a second position in which said closure means is outside of said first and second seats;

means for moving said closure means between said first and second positions;

first spring means for urging said closure means toward said second seat when said closure element is in its first position;

second spring means connected to said second seat to move said second seat towards said first seat whereby said second seat can urge said closure element, against the action of said first spring means, toward said first seat when said closure means is in its first position; and

actuator means connected to said second seat to move said second seat, against the action of said second spring means, away from said first seat into a retracted position in which said second seat is axially spaced from said closure element.

5,487,533

AUTOMATIC TRANSPORT VEHICLE WITH THREE-AXIS MOTION SENSING AND VIBRATION DAMPING

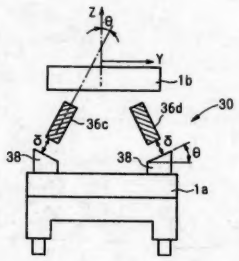
Yutaka Kurita, and Yasushi Muragishi, both of Ise, Japan, assignors to Shinko Electric Co., Ltd., Japan

Filed Jun. 2, 1994, Ser. No. 252,912

Claims priority, application Japan, Jun. 4, 1993, 5-134965

Int. Cl.[6] B60P *7/16*

U.S. Cl. 267—140.5 **20 Claims**



1. An automatic transport vehicle capable of damping vibration of a load carried thereon, the vehicle comprising:

a truck which is freely movable on road surface or track;

a bed supported elastically on the truck;

sensors which detect vibrations in the bed and which output detection signals;

at least a first actuator which displaces the bed relative to the truck in a first direction through which a first sensor detects the vibration,

a second actuator which displaces the bed relative to the truck in a second direction through which a second sensor detects the vibration,

a third actuator which displaces the bed relative to the truck in a third direction through which a third sensor detects the vibration, and

a controller which controls the actuators in response to detection signals from the sensors,

wherein the directions of action of the actuators are inclined with respect to the perpendicular to a plane in which the truck moves, the directions of action of the actuators facing in mutually different directions, the sensors detecting vibrations in the direction of action of each of the actuators.

5,487,534

LAMINATED RUBBER VIBRATION CONTROL DEVICE FOR STRUCTURES

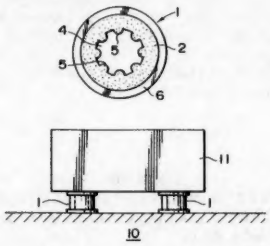
Mitsuo Sakamoto; Norihide Koshika; Isáo Nishimura; Katsuyasu Sasaki, and Satoshi Oorui, all of Tokyo, Japan, assignors to Kajima Corporation, Tokyo, Japan

Division of Ser. No. 976,437, Nov. 13, 1992. This application Sep. 30, 1994, Ser. No. 315,697

Claims priority, application Japan, Nov. 15, 1991, 3-300408

Int. Cl.[6] F16F *7/00*

U.S. Cl. 267—141.1 **16 Claims**



1. A hollow core support and damper comprising: a plurality of vertically stacked rubber members having center openings and upper and lower parallel planar surfaces; first steel plates with like center openings interposed between and secured to adjacent rubber members, said stacked rubber members and said steel plates forming inner and outer wall surfaces to define a hollow core; a pair of imperforate second steel plates, one of which is secured to the said upper planar surface of the uppermost of said vertically stacked rubber members and the other of which is secured to said lower planar surface of the lowermost of said vertically stacked rubber members to sandwich said hollow core therebetween to form and to maintain an imperforate enclosed hollow chamber; at least one of said wall surfaces being configured to resist buckling of said damper due to horizontal deformation; a first horizontally vibration mass; a second horizontally vibratable mass; a plurality of said hollow core supports being positioned between said first horizontally vibratable mass and said second horizontally vibratable mass to position and to support said second horizontally vibratable mass vertically above said first horizontally vibratable mass, whereby said hollow core damper provides a high seismic vibration induced horizontal stroke, low horizontal shearing stiffness, and a long horizontal vibration period; whereby said second horizontally vibratable mass is free to vibrate passively on said plurality of said hollow core supports in response to horizontal seismic vibrations impacting said first horizontally vibratable mass; and wherein said inner wall surface of at least one said hollow core support is vertical and includes a plurality of reinforcing ribs.

5,487,535

SUSPENSION STRUT METAL-TO-METAL JOUNCE STOP

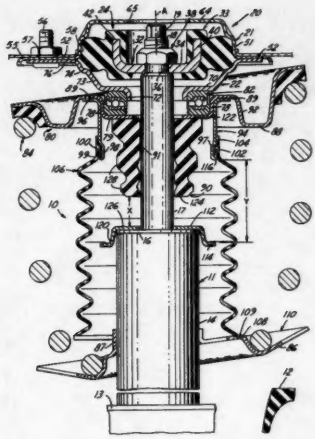
Robert L. Carter, Gibraltar, and Sophia C. Barr, Birmingham, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 5, 1994, Ser. No. 349,297

Int. Cl.[6] B60G *15/00*

U.S. Cl. 267—220 **5 Claims**

1. A shock-absorbing assembly for use in a suspension system for an automotive vehicle, the assembly operatively connected between sprung and unsprung masses of the vehicle, the assembly comprising a shock unit having a piston rod extending through an opening in one upper end thereof disposed for reciprocal movement along a principal axis of said unit, a mount fixed on an upper end of the piston rod adapted for attachment to the sprung mass, an annular support member located subjacent the upper mount, a metal-to-metal jounce stop arrangement for the assembly comprising:



means supporting an annular radially extending jounce stopper ledge adjacent said unit upper end;

a cylindrical metal canister fixed to and extending downwardly from an underside of the support member concentrically disposed on said unit principal axis, an elastomeric jounce bumper concentrically positioned on an upper portion of the rod having an upper end face in flush abutment with a central portion of the support member and a lower end face spaced a predetermined dimension above said unit upper end with the assembly in a static design mode;

said canister in said design mode concentrically encircling an upper portion of said bumper with its lower extremity defining an annular stopper edge vertically positioned intermediate said bumper upper and lower end faces so as to define a predetermined maximum axial jounce dimension between said canister stopper edge and said unit stopper ledge;

wherein upon the assembly undergoing maximum jounce travel said canister stopper edge contacting said unit stopper ledge said jounce bumper being compressed a predetermined axial dimension between said support member and said unit upper end obviating over-compression of said bumper thereby increasing the service-life thereof.

5,487,536

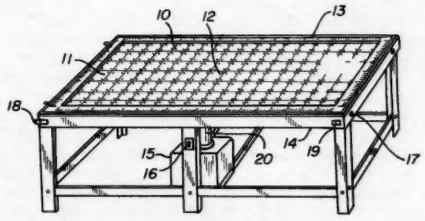
BANNER TABLE

Jerry F. McEachin, 3999 Williams St., Clarkston, Ga. 30021

Filed May 4, 1994, Ser. No. 237,775

Int. Cl.[6] B25B *11/00*

U.S. Cl. 269—21 **8 Claims**



1. A table for cutting banners, the device comprising:

(a) a top surface of steel;

(b) a plurality of V-shaped grooves in the top surface for guiding a cutting instrument, the grooves having a rectangular grid pattern on the top surface and the grooves extending to an edge of the top surface;

(c) a measuring guide along each edge of the top surface for measuring a dimension of the banner, at least two adjacent guides raised to allow alignment of the banner to a corner of the top surface, and at least one measurement guide being removable;

(d) a clamp to clamp an end of a first table to an end of a second table;

(e) at least one alignment pin to align the grooves of the ends of the first and second tables;

(f) a vacuum chamber below the top surface;

(g) a vacuum means connected to the chamber; and

(h) a plurality of apertures between the top surface and the vacuum chamber to secure the banner to the top surface.

5,487,537

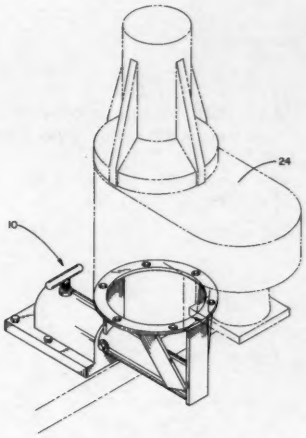
TRANSFER CASE STAND

Robert A. Rye, 523 E. Tamarack, Ironwood, Mich. 49938

Filed Jun. 9, 1994, Ser. No. 257,177

Int. Cl.[6] B23Q *1/04*

U.S. Cl. 269—51 **3 Claims**



1. A transfer case stand for securely holding and supporting a transfer case of a vehicle from a fixed location for allowing ready access by a mechanic comprising, in combination:

a rigid and tubular casing having an open base end and a sealed tip end with the base end having a base coupling hole disposed therethrough;

a rigid ring positioned at a location above the casing such that the central axis of the ring is perpendicular to the central axis of the casing, the ring having a plurality of holes disposed therearound for receiving bolts of a transfer case of a vehicle;

a first brace, a second brace, a third brace, and a fourth brace with the first brace extended between the base end of the casing and the ring, the second brace extended between the tip end of the casing and the ring, and the third brace and the fourth brace being opposed and extended between the ring and casing near the tip end thereof such that the second brace, third brace, and fourth brace define a tripod;

a rigid holder having a planar base plate with an integral eyelet extended upwards therefrom to define a horizontally positioned aperture;

a rigid extension tube having a base section slidably and rotatably disposed within the aperture of the eyelet and a tip section disposed through the base end of the casing, the base section having a first coupling hole disposed therethrough and a second coupling hole disposed therethrough at a location perpendicular to the first coupling hole, the tip section having a third coupling hole disposed therethrough and aligned with the second coupling hole;

first coupling means secured through the base coupling hole of the casing and third coupling hole of the extension tube, thereby coupling the casing with the extension tube;

second coupling means extended through the eyelet of the holder, the second coupling means adapted to be secured through the first coupling hole of the extension tube in one orientation, thereby coupling the holder with the extension tube at a position such that the ring faces upwards, whereby allowing a transfer case coupled thereto to be held in a vertical orientation, the second coupling means further adapted to be secured within the second coupling hole of the extension tube in another orientation, thereby coupling the holder with the extension tube at a position such that the ring faces sideways, whereby allowing a transfer case coupled thereto to be held in a horizontal orientation; and

third coupling means adapted for securing the base plate of the holder to a fixed location such as a work bench.

5,487,538

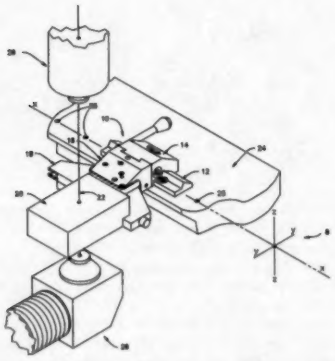
WORKPIECE HOLDING ASSEMBLY

Michael D. Tibbet, Ventura, Calif., assignor to Glaser Tool Co., Ventura, Calif.

Filed Aug. 10, 1994, Ser. No. 288,067

Int. Cl.[6] B23Q *1/04*

U.S. Cl. 269—71 **19 Claims**



1. A machine workpiece holding assembly having a machine table comprising:

a base module comprising a rail secured to said machine table and a rail clamp secured to said rail, said rail clamp having a leveler connector means for releasably engaging a leveler head; and,

a release module detachably connected to said base module comprising a leveler head having an attachment portion and a connector portion releasably engaged with said leveler connector means and, a workpiece clamping means for holding a workpiece having an attachment region connected to said leveler head attachment portion, said leveler head including a cant adjustment means for angularly orienting said workpiece clamping means comprising a pivot contact and two vertically adjustable contacts which are spaced from each other in a triangular pattern about said attachment portion.

5,487,539

APPARATUS FOR CLAMPING A WORK PIECE IN A WELL DEFINED POSITION

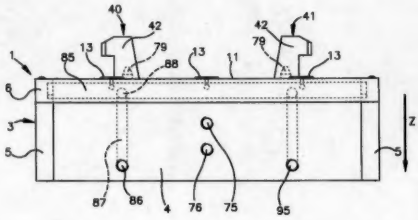
Basil Obrist, Gontenschwil, Switzerland, assignor to Erowa AG, Reinach, Switzerland

Filed May 3, 1994, Ser. No. 237,195

Claims priority, application Germany, May 4, 1993, 43 14 629.5

Int. Cl.[6] B23Q *1/06*

U.S. Cl. 269—309 **27 Claims**



1. An apparatus for clamping a work piece in a well defined position in the working area of a machining apparatus, comprising:

a base member adapted to be fixed in the working area of the machining apparatus;

a work piece carrier member adapted to be put onto said base member and to be clampingly fixed to said base member, said work piece carrier member being adapted to receive a work piece to be machined;

first aligning means provided on said base member and second aligning means provided on said work piece carrier member, said first and second aligning means cooperating in pairs with each other upon putting said work piece carrier member onto said base member to align the position of said work piece carrier member in three coordinate axes running perpendicularly to each other and with regard to its angular orientation;

clamping means generating a clamping force which keeps said work piece carrier member in a position defined by said first and second aligning means on said base member;

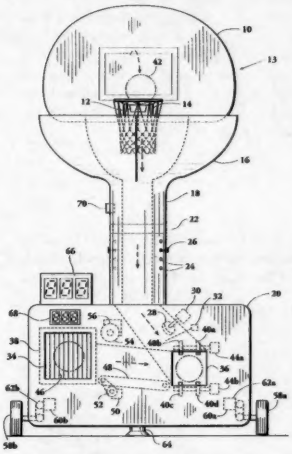
said first and second aligning means comprising first aligning element pairs including first and second stop surfaces cooperating with each other to define the position of said work piece carrier member in a coordinate axis (Z) running parallel to the direction of said clamping force generated by said clamping means;

said first and second aligning means comprising two laterally located and one centrally located second aligning element pairs including each a conically cross sectioned aligning ruler member as well as a counterpart member having a matching centering slot, said aligning ruler members and said counterpart members cooperating with each other to define the position of said work piece carrier member in a coordinate plane which is set by the two other coordinate axes (X and Y);

two opposite end portions of said base member and said work piece carrier member each being provided with one of said laterally located second aligning element pairs which together define the position of said work piece carrier member, -(a) in a coordinate axis (Y) running perpendicular to the connection line between said two second aligning element pairs, and -(b) with regard to its angular orientation, and a central portion of said base member and said work piece carrier member between said two laterally located second aligning element pairs being provided with a further one of said centrally located second aligning element pairs to define the position of said work piece carrier member in the third coordinate axis (X);

said clamping means comprising two synchronously operated clamping members, each one thereof being located between said centrally located second aligning element pair and one of said laterally located second aligning element pairs.

5,487,540
APPARATUS FOR USE IN PRACTICING THE FUNDAMENTALS OF BASKETBALL
Dickie R. Bixler, and Jessica A. Bixler, both of Rte. 1, Box 33, Dacoma, Okla. 73731
Filed May 22, 1995, Ser. No. 445,679
Int. Cl.[6] A63B *69/00*
U.S. Cl. 273—1.5 A **11 Claims**



11. An apparatus for use in practicing the fundamentals of basketball, comprising;

a. a retrieving bowl adapted to connect to a basketball goal to recover a basketball;

b. an adjustable, swivelable chute having upper and lower ends, the upper end being connected to the retrieving bowl; and

c. a base unit having:

(1) an ejection box connected to the lower end of the chute, the ejection box having motor-driven speed control wheels adjacent thereto;

(2) a passing box having a target area covered by a one-way flap; and

(3) a gravity channel extending from the passing box to the ejection box.

5,487,541
PING PONG TABLE COVER
Ivan S. Dictor, 16 Dione La., Hauppauge, N.Y. 11788
Filed Jun. 20, 1994, Ser. No. 262,544
Int. Cl.[6] A63B *67/04*
U.S. Cl. 273—30 **5 Claims**

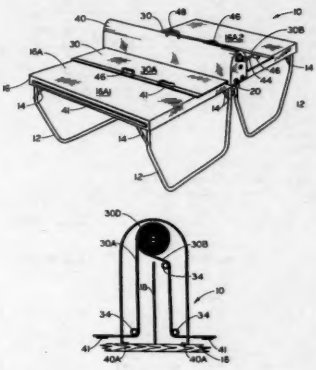
1. A cover for a table tennis table having a panel delineating a rectangular substantially horizontal playing surface of a predetermined width and length, and a net positioned centrally of said length and spanning said width, said cover comprising;

a pair of rectangular strips of flexible weather barrier material, each strip having first and second ends and a length greater than one-half the length of said playing surface, and being substantially equal to the width of said playing surface;

an elongated shaft, means for rotatably supporting said shaft in a plane substantially parallel to and above said net;

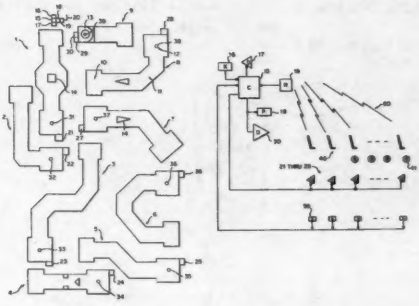
means on said shaft for rotation thereof;

means connecting said first end of each rectangular strip longitudinally along said shaft, whereby rotation of said shaft in one direction will cause said strips to be wound about said shaft and rotation of said shaft in a direction opposite said one direction will cause said strips to unwound from said shaft for extension of said strips over a cooperating half of said playing surface;



means on said second end of each strip for attaching said second end to cooperating attachment means on said table.

5,487,542
AUTOMATICALLY-SCORING GOLF GAME
Thomas P. Foley, 518 Red Oak Dr., Severna Park, Md. 21146
Filed Mar. 21, 1995, Ser. No. 408,044
Int. Cl.[6] A63B *69/36;67/02*
U.S. Cl. 273—176 FA **20 Claims**



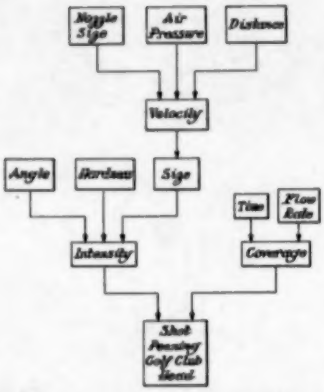
18. In a plurality of clubs for striking balls, the improvement comprising:

a ball-strike sensor associated with each respective club;

a transmitter associated with each respective club, the transmitter being electrically coupled to the ball-strike sensor of the respective club for emitting an electrical signal upon striking the ball, the signal being unique to the respective club and distinguishable from signals of all others of the clubs whereby any of the plurality of clubs may be identified upon striking a ball.

5,487,543
SHOT PEENED GOLF CLUB HEAD
Charles R. Funk, 6202 N. Camino De Santa Valera, Tucson, Ariz. 85718
Filed Feb. 9, 1995, Ser. No. 386,263
Int. Cl.[6] A63B *53/04*
U.S. Cl. 273—78 **10 Claims**

10. A treated golf club made by a method which includes providing a golf club having a metal head with an exposed metal ball striking surface which is shot peened to improve feel with minimal vibrational feel in the hands of the user when the user strikes a golf ball with said ball striking surface, and with the shot



peening work hardening said exposed metal ball striking surface and creating a compressive stress in said ball striking surface.

5,487,544

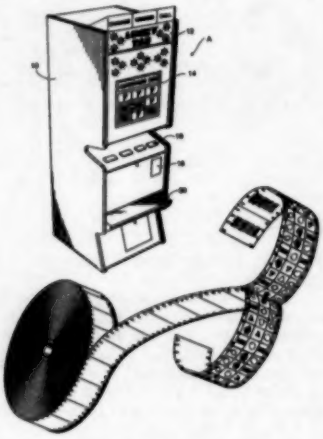
ELECTRONIC GAMING APPARATUS AND METHOD

Ronald C. Clapper, Jr., 20753 Horace St., Chatsworth, Calif. 91311

Continuation of Ser. No. 879,747, May 6, 1992, Pat. No. 5,348,299. This application Sep. 14, 1994, Ser. No. 306,108

Int. Cl.[6] A63F *9/24*

U.S. Cl. 273—138 A **22 Claims**



1. An improved pre-printed ticket containing strip for use in an electronic gaming apparatus of the type capable of dispensing a segment of a strip to be used as a ticket and which may win or score in a game depending on pre-printed indicia which may appear on the segment; said pre-printed ticket containing strip comprising a plurality of successive pre-printed strip segments capable of being severed from the strip to constitute tickets, each said strip segment further comprising:

a) a primary strip segment with a first face and a second face on the opposite side of the first face;

b) each of said plurality of strip segments constituting a separate ticket defining location on said strip with indicia on said first face in each of the separate locations and where the indicia of some locations will differ from the indicia of other locations, each of said strip segments arranged to be separated from said strip to provide a ticket which is dispensable from said gaming apparatus, certain of said tickets containing winning indicia and which tickets are randomly distributed throughout said ticket containing strip;

c) a code representative of the indicia associated with the separate strip segment on the strip and where information in the code is unintelligible to an individual by visual examination and only machine readable, such that the code can be read by the apparatus for further processing; and

d) a secondary strip disposed in juxtaposed relationship to the first face of the primary strip segment and capable of being separated from the primary strip segment, said indicia being hidden from view by said secondary strip and being visible when said secondary strip is removed and where removal of the secondary strip before dispensing of the ticket is evidence of tampering with the ticket.

5,487,545

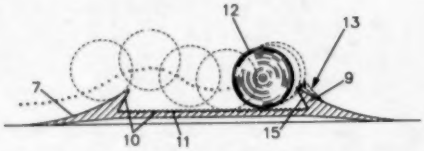
PORTABLE GOLF PUTTING CUP

Eric J. Schindler, 9086 Summerhill Point, Alpine, Calif. 91901

Filed Aug. 26, 1994, Ser. No. 296,681

Int. Cl.[6] A63B *69/36*

U.S. Cl. 273—178 R **2 Claims**



1. An indoor/outdoor golf putting cup comprising:

A circular base;

A central depression consisting of a bottom and a reclining inner wall wherein said reclining wall intersects said bottom at an acute angle; an upper surface which inclines from the outer edge of said base to the edge of said reclining inner wall of said central depression; wherein said upper surface and said reclining inner wall having a means for preventing a ball from jumping out of the cup comprising a flexible and shock absorbing material;

A reclining inner wall containing a plurality of ridges to grip the ball and slow it down;

said bottom of said center depression containing a plurality of ridges to grip the ball and slow the rotation of said ball.

5,487,546

GOLF TRAINING METHOD

John P. Yasuda, 18905 Vista Portola Rd., Trabuco Canyon, Calif. 92679

Filed Mar. 2, 1995, Ser. No. 399,168

Int. Cl.[6] A63B *69/36*

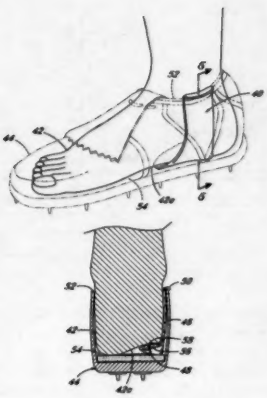
U.S. Cl. 273—187.2 **5 Claims**

1. A method of aiding a golfer to properly transfer weight to an inside portion of a rear foot during a golf swing, comprising:

inserting a rear foot of a golfer into a shoe;

inserting a device having a generally flat body, with a length roughly equal to a distance between a top rim surrounding a main opening of a shoe and a portion of an instep of a foot of a wearer within said shoe, and a first flange extending generally horizontally inward from a lower portion of said body into said shoe such that said body extends generally vertically along a vertical wall of said shoe and said first flange extends generally horizontally above an insole of said shoe;

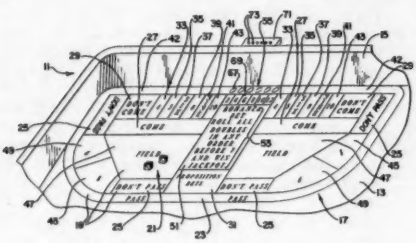
bringing said device into contact with said foot so that said flange exerts pressure on an underside of said instep of said foot.



5,487,547
CRAPS LAYOUT ARRANGEMENT HAVING JACKPOT AREA

Marcus V. Hobert, 3318 Kenwood Ave., Davenport, Iowa 52807

Filed Sep. 13, 1994, Ser. No. 305,178
Int. Cl.[6] A63F 9/04
U.S. Cl. 273—274 29 Claims



2. An amusement device comprising:

a pair of dice each having six faces bearing a visual representation of the numbers one through six, said dice being of a size for manually rolling to present one of eleven different numbers which define a plurality of point numbers, at least one natural number, and at least one craps number;

a game layout to provide a flat surface upon which said dice may be rolled and upon which bets may be laid by physical placement of wagers, said flat surface including indicia thereon representing a plurality of wager areas, said wager areas including:

(a) a pass line area for receiving a wager betting both

(i) that one or more rolls of dice will yield an established first point number without rolling the number "7"; and

(ii) that a natural number is rolled prior to establishing the first point number or prior to rolling a craps number;

(b) a don't pass area for receiving a wager betting both

(i) that one or more rolls of the dice will yield the number "7" prior to the rolling of an established first point number; and

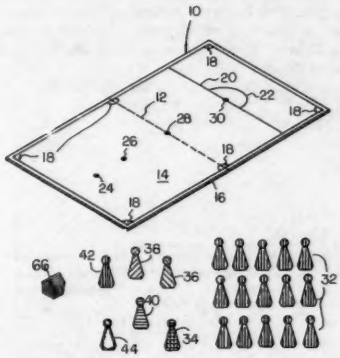
(ii) that a craps number is rolled prior to establishing the first point number or prior to rolling a natural number; and

(c) a jackpot area for receiving a wager that a set of a plurality of dice outcomes are rolled, said set having a remote probability of occurrence.

5,487,548
QUESTION AND ANSWER BOARD GAME REPRESENTING SNOOKER

Thomas M. Daly, and Rita Daly, both of 87 Comeragh Park, Dillions Cross, Cork City, Ireland

Continuation of Ser. No. 82,518, Jun. 25, 1993, abandoned, which is a continuation of Ser. No. 870,674, Apr. 17, 1992, abandoned. This application Oct. 19, 1994, Ser. No. 326,810
Int. Cl.[6] A63F 9/18
U.S. Cl. 273—431 17 Claims



1. A method of playing a question and answer board game comprising the following steps:

(a) providing game board means simulating a SNOOKER table;

(b) providing twenty-one game board pieces positionable on said game board means, said game pieces having the same colors respectively as the balls used in SNOOKER and including fifteen red game board pieces, one yellow game board piece, one green game board piece, one brown game board piece, one blue game board piece, one pink game board piece, and one black game board piece;

(c) assigning ascending point values to said game pieces as follows:

red=1
yellow=2
green=3
brown=4
blue=5
pink=6
black=7

(d) providing a series of seven questions ranging in difficulty from easiest to most difficult, the seven questions being labeled in order of ascending difficulty as red, yellow, green, brown, blue, pink, and black;

(e) permitting a player to attempt to answer the easiest question in said series, said easiest question being a red question;

(f) permitting said player to attempt to answer a second question in said series of questions if said player answers said easiest question correctly, said second question being more difficult than said easiest question, said second question being selected by chance from said series of questions, wherein said second question must be a color question selected from the group consisting of yellow, green, brown, blue, pink, and black;

(g) assigning point values to said questions in said series, said point values ascending in accordance with difficulty and being equal to said point values assigned to said colors in step (c);

(h) deriving said player's score by summing together the point values of the questions in said series correctly answered by said player;

(i) associating the game board pieces and their respective colors with the point values assigned to said series of questions;

(j) removing the game pieces from said board when a corresponding question is correctly answered by an individual player;

(k) permitting said player to attempt to answer a third question in said series of questions if said player answers said second

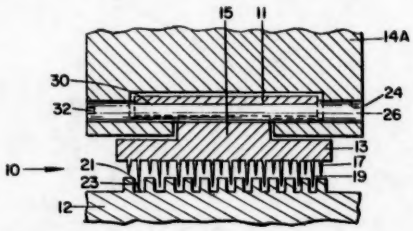
question correctly, said second question being selected by chance from said series of questions, wherein said second question must be a color question selected from the group consisting of yellow, green, brown, blue, pink, and black.

5,487,549

TURBINE INTERFITTING PACKING WITH CAM ADJUSTMENT

William S. Dalton; Patrick S. Dalton, both of Chesterfield, and Richard S. Clark, Feeding Hills, all of Mass., assignors to Demag Delaval Turbomachinery Corp. TurboCare Division, Chicopee, Mass.

Filed Oct. 24, 1994, Ser. No. 328,016
Int. Cl.[6] F16J *15/447*
U.S. Cl. 277—54 **1 Claim**



1. In an elastic fluid turbine employing packing ring segments mounted in a ring-like stationary holder or diaphragm having upper and lower half-parts which meet at a horizontal joint and circumscribe a rotor to minimize leakage between the components, the improvements which comprise means for interfitting the butt ends of certain of the packing ring segments at the diaphragm horizontal joint comprising slots in the butt ends of said certain of the packing ring segments located in the diaphragm upper half-part and protrusions on the butt ends of said certain of the packing ring segments located in the diaphragm lower half-part, the protrusions being engageable with the slots in interfitting manner at the diaphragm horizontal joint, and cam means on the diaphragm adjacent the horizontal joint and engageable with said certain of the packing ring segments for accurately positioning the packing ring segments relative to the horizontal joint, said cam means comprising cam pins mounted for rotation in pin holes in the diaphragm in the upper half part adjacent each end thereof and located upwardly of the horizontal joint, the cam pins extending through a cam slot in said certain of the packing ring segments, each cam pin having a cam surface engageable with the cam slot in the packing ring segment.

5,487,550

SECONDARY GAS/LIQUID MECHANICAL SEAL ASSEMBLY

Richard F. Salant; Itzhak Green, both of Dunwoody, Ga.; Larry A. Hufford, Vista, and Oley Giles, Glendale, both of Calif., assignors to BW/IP International, Inc., Long Beach, Calif.

Continuation of Ser. No. 792,517, Nov. 12, 1991, abandoned. This application May 26, 1993, Ser. No. 67,487
Int. Cl.[6] F16J *15/38*
U.S. Cl. 277—65 **15 Claims**

1. A mechanical seal assembly for preventing the flow of liquid along a shaft that is rotatable within a housing, the mechanical seal assembly comprising:

a primary mechanical seal assembly mounted around the shaft for preventing the flow of liquid along the shaft such that, in normal operation, a liquid medium exists on an upstream side of the primary mechanical seal assembly and a gaseous medium exists on a downstream side of the primary mechanical seal assembly; and

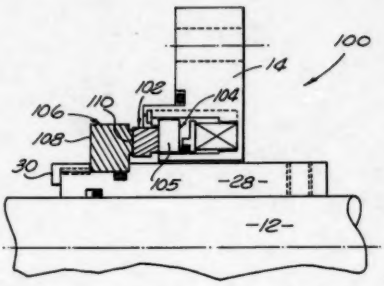
a secondary mechanical seal assembly mounted around the shaft on the downstream side of the primary mechanical seal assembly such that, in normal operation, the gaseous medium exists on an upstream side of the secondary mechanical seal assembly and, upon failure of the primary mechanical seal assembly, the liquid medium exists on the upstream side of the secondary mechanical seal assembly, the secondary mechanical seal assembly comprising

a stationary seal face element having a front surface and a back surface, and rotationally fixed relative to the housing, and

a rotating seal face element having a front surface and a back surface, and fixed relative to the shaft, the front surfaces of the seal face elements being in opposed relation to one another,

wherein the back surface of the stationary seal face element includes a slotted configuration that, during normal operation, generates a wave on the front surface of the stationary seal face element sufficient to generate an opening force to drive the seal face elements apart and provide a seal against the gaseous medium, and

wherein, upon failure of the primary mechanical seal assembly, a resulting hydrodynamic loading of the liquid medium on the seal face elements transitions the secondary mechanical seal assembly to provide a seal against the liquid medium.

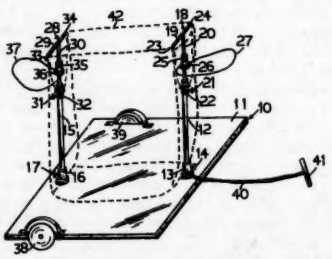


5,487,551

FLEXIBLE BAG MOUNTING AND CARRYING DEVICE

Samuel Kennedy, 540 Timothy Street, Apt. 302, New Market, Ontario, Canada

Filed Nov. 9, 1994, Ser. No. 336,398
Int. Cl.[6] B65B *67/12;* **B62B** *1/22*
U.S. Cl. 280—47.19 **9 Claims**



1. A flexible bag mounting and carrying device comprising,

a base board member,

two tubular post members mounted in an upright position on said base board member, said tubular post members being located directly opposite to each other,

a first T-shaped mounting bracket member mounted at the top of one tubular post member, said first T-shaped mounting bracket member having a horizontal bar member and an elongated vertical leg member, said vertical leg member being slidably engaged with the top portion of said one tubular post member, said horizontal bar member having a vertical slot formed at each end therein,

a second T-shaped mounting bracket member mounted at the top of the other tubular post member, said second T-shaped mounting bracket member having a horizontal bar member and an elongated vertical leg member, said vertical leg member of said second T-shaped mounting bracket member being slidably engaged with the top portion of said other tubular post member, said horizontal bar member of said second T-shaped mounting bracket member having a vertical slot formed at each end therein,

a first slider member slidably mounted on said elongated vertical leg member of said first T-shaped mounting bracket member, said first slider member being normally maintained in a selected position on said vertical leg member of said first T-shaped mounting bracket member by a set screw means provided on said first slider member,

a second slider member slidably mounted on said elongated vertical leg member of said second T-shaped mounting bracket member, said second slider member being normally maintained in a selected position on said vertical leg member of said second T-shaped mounting bracket member by a set screw means provided on said second slider member,

a first loop-shaped cable means mounted on said first slider member, said first loop-shaped cable means being operative to engage in a looping manner with said horizontal bar member of said first T-shaped mounting bracket member and said slots formed therein,

a second loop-shaped cable means mounted on said second slider member, said second loop-shaped cable means being operative to engage in a looping manner with said horizontal bar member of said second T-shaped mounting bracket member and said slots formed therein.

5,487,552

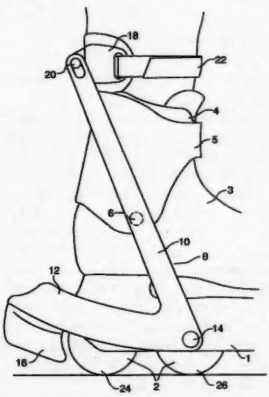
BRAKING MECHANISM FOR IN-LINE SKATES

Bernard Daoust, Montreal, Canada, assignor to Canstar Sports Group Inc., Ville Mont Royal, Canada

Filed Jul. 1, 1994, Ser. No. 266,354

Int. Cl.[6] A63C *17/14*

U.S. Cl. 280—11.2 **19 Claims**



1. A braking mechanism for an in-line skate, said skate having a boot and a wheel-carrying chassis secured beneath said boot, said braking mechanism comprising two generally L-shaped levers, configured for positioning one on each side of the skate, each lever having two arms, comprising an upwardly projecting arm and a rearwardly projecting arm, the area of each said lever where said arms of said lever intersect being configured for pivotal connection to said chassis at one of corresponding pivotal connections on each side of the chassis, such that when so connected at one of said pivotal connections, each said upwardly projecting arm extends upwardly from said pivotal connection towards the rear of the calf of a skater wearing said skate, to an upper distal end, and such that each said rearwardly projecting arm extends rearwardly from said wheel chassis to a rearward distal end, said rearward distal ends being joined and having a brake pad secured beneath them, said upper distal ends having a braking pressure receiving means mounted on or extending laterally between them, configured for positioning behind the skater's calf, whereby rearward rotation of the skater's calf relative to the boot, when said braking mechanism is installed, produces rearward movement of said upper distal ends, thereby moving said brake pad downwardly by virtue of rotation of said levers about said pivotal connections, to engage the ground.

5,487,553

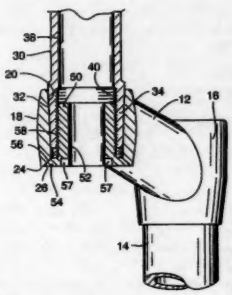
STEERING FORK FOR BICYCLES

James D. Pileggi, Beaverton, Oreg., assignor to Halson Designs, Inc., Wilsonville, Oreg.

Filed Sep. 8, 1994, Ser. No. 303,175

Int. Cl.[6] B62K *21/04*

U.S. Cl. 280—280 **4 Claims**



1. A steering fork for a bicycle comprising:

struts for connection to an axle of a bicycle front wheel at each side of the wheel, and a crown interconnecting the struts, an opening through the crown defining an interior wall surface having a frustum-like taper with its large end at the top of the crown, the bottom of the opening defining a peripheral shoulder;

multiple replaceable steerer tubes having application to different bicycle designs with base portions having an exterior outer wall surface with a frustum-like taper that coincides with the interior wall surface of the opening in the crown, said base portions of said steerer tubes having an open bottom end exposing a straight inner wall portion provided with screw threads; and

a bolt having a head portion and a shank portion, the head portion sized to fit against the shoulder defined in the bottom of the opening in the crown and the shank portion provided with screw threads that mate with the screw threads of the inner wall portion of the steerer tube whereby, the base portion of the steerer tube is inserted in the opening through the crown, the bolt is engaged with the threaded opening in the steerer tube and the head of the bolt is seated against the shoulder of the crown as the bolt is screwed into the steerer tube to effectively press fit the tapered exterior wall surface of the steerer tube against the tapered interior wall surface surrounding the opening in the crown.

5,487,554
BICYCLE TRAINING APPARATUS

William A. May, 3701 Rice Blvd., Houston, Tex. 77005

Filed Aug. 5, 1994, Ser. No. 286,655
Int. Cl.[6] B62H *1/10;* B62J *9/00*
U.S. Cl. 280—293 11 Claims

1. A training apparatus for installation on the frame and adjacent the rear wheel of a bicycle comprising:

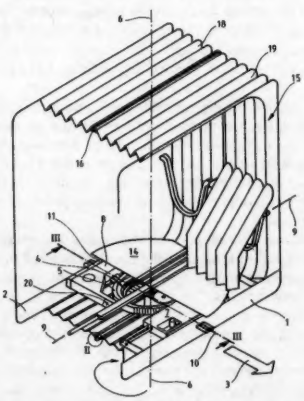
a handle member having a base section and a pair of legs extending distally from the base section, the distal ends of the legs being adapted for connection to the bicycle frame;

a substantially U-shaped bracing member having a transverse section and a pair of arms extending distally from the transverse section, the arms having distal ends adapted for connection to the bicycle frame and proximate portions attached to the legs of the handle member, whereby upon connection of the handle member to the bicycle frame the base section is disposed above the bicycle frame and rearward of the bicycle's rear wheel.

5,487,555
HINGE CONNECTION BETWEEN TWO VEHICLES CONNECTED TO EACH OTHER IN AN ARTICULATED MANNER

Robert Koch, Bad Sooden-Allendorf; Knud Mosaner, Kassel, and Roland Schleicher, Fuldatal, all of, Germany, assignors to Hubner Gummi - und Kunstoff GmbH, Germany

Filed May 4, 1993, Ser. No. 57,714
Claims priority, application Germany, May 7, 1992, 42 15 065.5; Jun. 25, 1992, 42 20 777.0; Aug. 17, 1992, 42 27 126.6
Int. Cl.[6] B60D *1/50*
U.S. Cl. 280—403 11 Claims



1. A hinge connection for connecting first and second articulated vehicles comprising

fifth wheel ring means having an inner ring member and an outer ring member rotationally mounted thereon for relative pivotal movement about a vertical buckling axis,

a base rigidly connected to one of said inner ring member and outer ring member,

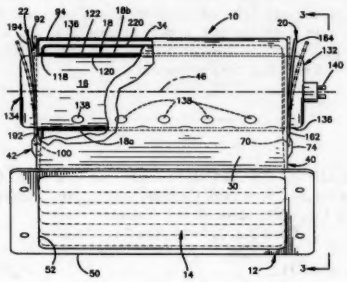
rigid connection means fixedly connected to the other of said inner ring member and outer ring member for rigidly connecting said other ring member to one of said first and second articulated vehicles, and

elastomeric connection means mounted on said base outside of the circumference of said outer ring member for flexibly connecting said base to the other of said first and second articulated vehicles, said elastomeric connection means comprising a first plurality of elastomeric members whereby the pitch axis of said vehicles is displaced off center to a position between the outer circumference of said outer ring member and said other vehicle, at least one of said elastomeric members having a rubber component disposed in between two metal components, said metal components being spaced in the longitudinal direction.

5,487,556
AIR BAG MODULE

Jeffrey A. Jenkins, Shelby Township, and John W. Wiers, Romeo, both of Mich., assignors to TRWVehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Sep. 19, 1994, Ser. No. 308,364
Int. Cl.[6] B60R *21/16*
U.S. Cl. 280—728.2 18 Claims



1. A vehicle safety apparatus comprising:

a housing;

an inflatable vehicle occupant restraint connected with said housing;

an inflation fluid source in said housing for supplying inflation fluid to said inflatable restraint, said inflation fluid source having a first end portion projecting from said housing; and

means for connecting said inflation fluid source with said housing, said connecting means comprising a spring member connected with said housing and having an annular configuration defining a central opening in said spring member, said first end portion of said inflation fluid source extending through said central opening in said spring member, said spring member including a portion having a first condition in which said first end portion of said inflation fluid source is movable through said central opening of said spring member and a second condition in which said first end portion of said inflation fluid source is not movable through said central opening of said spring member;

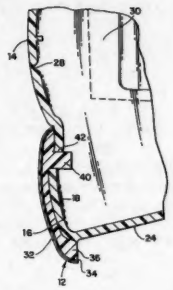
said spring member having a substantially planar configuration when said portion of said spring member is in the first condition and having an arcuate non-planar configuration when said portion of said spring member is in the second condition.

5,487,557

AIR BAG COVER HAVING AN APPLIQUE FASTENED THERETO AND METHOD OF MANUFACTURING SAME

Thomas L. Eckhout, Waterford, Mich., assignor to Larry J. Winget, Leonard, Mich.

Filed Oct. 20, 1993, Ser. No. 140,594
Int. Cl.[6] B60R *21/20*
U.S. Cl. 280—728.3 **17 Claims**



1. An automotive air bag cover comprising:
a front cover adapted to enclose an uninflated automotive air bag, the front cover having an inner surface and an outer surface, said outer surface further having an arcuate portion;
a seam formed in a surface of the cover for permitting the air bag to deploy; and
a decorative applique assembly permanently fastened over its area of exposure to a selected portion of said outer surface of said front cover in a non-overlapping fashion with said seam such that said decorative applique assembly does not detach from the front cover or interfere with said air bag upon inflation and exit of said air bag, said decorative applique assembly having a plastic liner and a decorative film fastened to a first surface of the plastic liner, the plastic liner and decorative film being shaped correspondingly to said arcuate portion of said outer surface, and said decorative applique assembly further having a plastic base attached to a second surface of said plastic liner to form said decorative applique assembly.

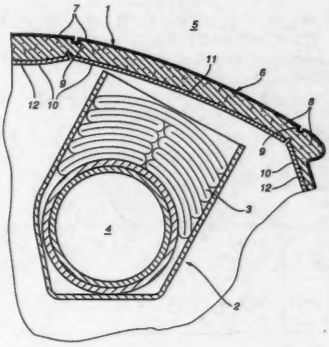
5,487,558

INSTRUMENT PANEL IN A MOTOR VEHICLE

Johannes Ball, Jockgrim; Wolfgang Henseler, Herrenberg; Uwe Gerstenberg, Kandel, and Thomas Fischer, Calw-Stammheim, all of, Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Sep. 29, 1994, Ser. No. 314,648
Claims priority, application Germany, Sep. 29, 1993, 43 33 135.1; May 27, 1994, 44 18 582.0
Int. Cl.[6] B60R *21/16*
U.S. Cl. 280—728.3 **6 Claims**

1. Instrument panel arrangement in a motor vehicle comprising:
an interior rigid reinforcement panel,
a foamed-plastic layer located above the reinforcement panel,
an outer skin which covers said foamed-plastic layer,
a cover section integrated into the instrument panel for covering an airbag unit, said cover section exhibiting a similar reinforcement panel, foamed-plastic layer, and outer skin as the adjacent instrument panel arrangement,
wherein the cover section is configured to move away and release an opening through which an airbag can unfold out of a receiving container of the airbag unit behind the instrument panel, and
wherein the similar reinforcement panel of the cover section is an adjoining part of said reinforcement panel separated from said reinforcement panel via cuts formed at an angle other than perpendicular to a plane of the reinforcement panel.

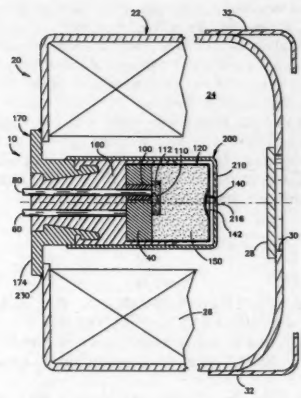


5,487,559

AIR BAG INFLATOR WITH PRESSURE SENSOR

Paul S. Headley, Mesa, Ariz., assignor to TRW Inc., Lyndhurst, Ohio

Filed Sep. 13, 1994, Ser. No. 305,064
Int. Cl.[6] B60R *21/26*
U.S. Cl. 280—735 **23 Claims**



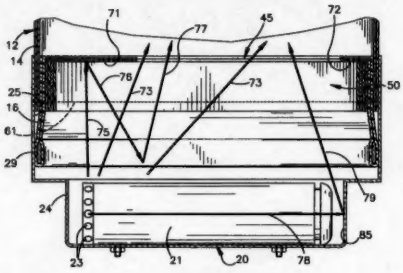
1. An apparatus for inflating an inflatable vehicle occupant restraint, comprising:
a container defining a chamber;
inflation fluid in the chamber at a pressure at least as great as a predetermined pressure; and
an electrically actuatable initiator connected with said container for, when actuated, causing said container to open to enable flow of inflation fluid into said inflatable vehicle occupant restraint to inflate said inflatable vehicle occupant restraint;
said initiator including pressure sensing means for sensing a decrease in the pressure in the chamber to a pressure below the predetermined pressure;
said initiator comprising an electrically conductive header supporting a pyrotechnic charge in said initiator, an inner cover electrically connected with said header and enclosing said pyrotechnic charge, and an outer cover disposed outward of and covering said inner cover, said pressure sensing means comprising said inner and outer covers.

5,487,560

APPARATUS FOR CONTROLLING FLOW OF INFLATION FLUID INTO AN AIR BAG

Al S. Emambakhsh, Flat Rock, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Aug. 19, 1994, Ser. No. 293,675
Int. Cl.[6] B60R *21/26*
U.S. Cl. 280—740 **12 Claims**



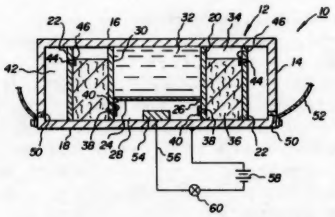
1. A vehicle occupant restraint system comprising:
an inflatable air bag;
a source of inflation fluid for inflating said air bag, said source of inflation fluid including (i) an inflator body having opposite ends and (ii) a nozzle opening disposed at one end of said inflator body;
deflector panel means attached to said air bag for (i) defining a single deflector opening through which inflation fluid is directed to flow into a predetermined region of said air bag to inflate said air bag along a predetermined trajectory and (ii) deflecting a portion of the inflation fluid flow from said nozzle opening disposed at said one end of said inflator body to flow through said deflector opening;
said deflector panel means comprising a first deflecting surface located on one side of said deflector opening and a second deflecting surface located on an opposite side of said deflector opening, said second deflecting surface having an area which is less than the area of said first deflecting surface.

5,487,561

SAFETY BAG INFLATION APPARATUS USING A LIQUID PROPELLANT GAS GENERATOR

John Mandzy, and David S. Degler, both of Pittsfield, Mass., assignors to Martin Marietta Corporation, King of Prussia, Pa.

Filed Dec. 9, 1994, Ser. No. 352,949
Int. Cl.[6] B60R *21/28*
U.S. Cl. 280—741 **29 Claims**



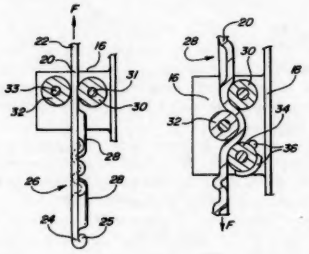
1. Occupant restraint apparatus for a motor vehicle, comprising:
an inflatable safety bag;
a housing having at least one vent in inflating fluid flow communication with the safety bag;
a reservoir of liquid propellant positioned in the housing;
a buffer zone positioned in the housing;
a first frangible seal separating the liquid propellant reservoir from the buffer zone;
a second frangible seal blocking fluid flow communication between the buffer zone and the housing vent; and
an inflation initiator, operating in response to a high impact vehicular accident, for pressurizing the buffer zone to initiate rupture of the first and second frangible seals and to ignite the liquid propellant in the buffer zone, ignition of the liquid propellant generating by exothermic reaction, a gas flowing from the buffer zone through the housing vent to inflate the safety bag.

5,487,562

ENERGY ABSORBING APPARATUS FOR A MOTOR VEHICLE

Gregory T. Hedderly, Livonia; Lisa A. Tyus, Belleville, and Leonard M. Brown, Farmington Hills, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1994, Ser. No. 364,908
Int. Cl.[6] B62D *1/11;* **B60R** *22/28*
U.S. Cl. 280—777 **17 Claims**



1. An energy absorbing apparatus for use in a motor vehicle, said energy absorbing apparatus comprising:
an anchor securely attached to said motor vehicle;
first and second rollers rotatably mounted to said anchor spaced apart from one another; and
a deformable strip threaded through said first and second rollers, said deformable strip comprising:
a first end adapted to receive an impact force from within said motor vehicle;
a second end opposite said first end;
and
a formed portion extending from said rollers to said second end, said formed portion includes prefabricated projections operative to be drawn through said first and second rollers when said impact force exceeds a predetermined minimum, said prefabricated projections thereby being plastically deformed in a predetermined order to provide variable withdrawal resistance of said formed portion, thereby controllably dissipating and absorbing energy from said impact force.

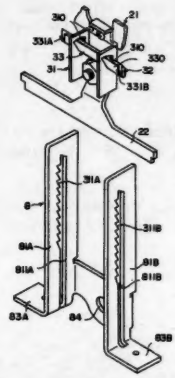
5,487,563

PRETENSIONER FOR VEHICLE SEAT BELT SYSTEMS

Koji Hiramatsu, Shiga, Japan, assignor to Takata Corporation, Tokyo, Japan

Continuation of Ser. No. 40,520, Mar. 31, 1993, abandoned. This application Jan. 9, 1995, Ser. No. 370,475
Claims priority, application Japan, Apr. 6, 1992, 4-112366
Int. Cl.[6] B60R *22/46*
U.S. Cl. 280—806 **4 Claims**

1. A pretensioner for a vehicle seat belt system having belt-pulling means connected to a belt system component, driving means for moving the belt-pulling means along a predetermined path in a direction to apply pretension to the belt, and return-



prevention means for preventing the belt-pulling means from moving in a direction such as to release the belt pretension and including a pawl coupled to the belt-pulling means, a support member having a set of ratchet teeth engageable by a tip of the pawl and a spring coupled to the pawl for biasing the pawl in a direction to engage the pawl tip with a tooth of the set of ratchet teeth, characterized in that the spring is a leaf spring that is U-shaped and includes a pair of leg portions and a base portion forming a loop connecting the leg portions and is received on the pawl with the base portion engaging the lower edge of the pawl and the leg portions engaging opposite surfaces of the pawl and an elastically deformable tongue portion extending from one of said portions of the leaf spring and engageable with one of a series of ratchet teeth on the support member upon movement of the belt-pulling means and the pawl in the release direction, the spring tongue portion being arranged relative to the pawl and to the set of ratchet teeth such that when the pawl and leaf spring are displaced in the release direction, the tongue portion engages a ratchet tooth and is deformed and bent back and applies an increased force to the pawl urging the pawl into engagement with a tooth of the set of ratchet teeth.

5,487,564

FASTENING DEVICE FOR A DEFLECTING FITTING

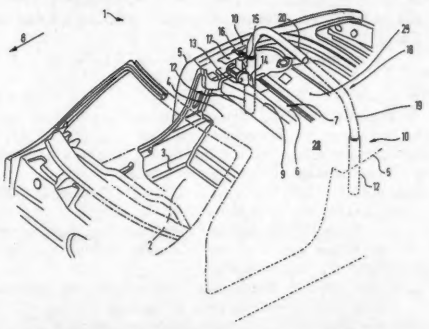
Peter Fueller; Juergen Kuebler; Herbert Guett, and Franz Amaseder, all of Munich, Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Germany

Filed Jul. 22, 1994, Ser. No. 278,908

Claims priority, application Germany, Jul. 23, 1993, 43 24 785.7

Int. Cl.[6] B60R *22/18;22/12;21/13*

U.S. Cl. 280—808 **17 Claims**



1. A fastening device for a guide fitting of a safety belt arrangement in a vehicle with a vehicle body which is open on top, the fastening device being arranged behind a seat in a rear portion of the vehicle body and extending above an approximately horizontally aligned partition of the vehicle body,

wherein the fastening device is formed by a hollow section which passes through an opening of the partition and continues below the partition, said hollow section being connected at a first connection location in an area of the opening of the partition, and at a second connection location at a support extending below the partition.

5,487,565

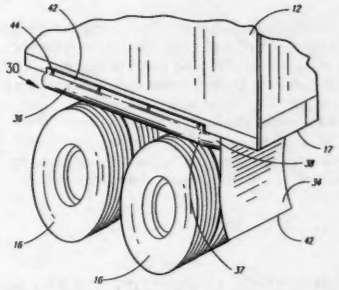
VEHICLE WATER SPRAY DIVERTER

Bradley J. Thompson, 9416 S. 69th East Ave., Skiatook, Okla. 74133

Filed Jan. 20, 1995, Ser. No. 375,955

Int. Cl.[6] B62B *9/16;* **B62D** *25/16*

U.S. Cl. 280—848 **10 Claims**



1. A device to block and divert lateral water spray generated from a vehicle, said vehicle including a plurality of tires and a body having a pair of lateral sides on opposite sides of a center, an underside between said lateral sides, and a rear, which device comprises:

an elongated, longitudinally extending first gutter portion attached to said vehicle to trap and direct said water spray toward said rear; and

a second gutter portion extending inwardly and downwardly and in fluid communication with said first gutter portion to divert said water spray from said first gutter portion away from said lateral sides toward said center and away from said underside down toward the ground.

5,487,566

PROMOTIONAL ADVERTISING BROCHURE INCLUDING REUSABLE ENVELOPE DEVICE

J. Richard Hedge, Jr., 3939 W. Windmills Blvd. #2035, Chandler, Ariz. 85226

Division of Ser. No. 28,521, Mar. 9, 1993, Pat. No. 5,333,909, which is a continuation of Ser. No. 746,072, Aug. 9, 1991, abandoned, which is a continuation-in-part of Ser. No. 488,470, Feb. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 376,639, Jul. 6, 1989, abandoned. This application Jul. 29, 1994, Ser. No. 283,025

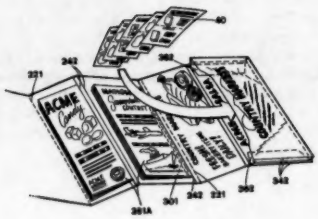
The portion of the term of this patent subsequent to Aug. 2, 2011, has been disclaimed.

Int. Cl.[6] B42D *15/00*

U.S. Cl. 283—56 **5 Claims**

1. A reusable aftermarket envelope made of material adapted to be imprinted with advertising and structural copy for incorporating promotional events as a coordinated residual instrument organizationally enhanced for spontaneous identification of, and access to, promotions prior to actual usage, comprising:

a sheet of material having a front side and a reverse side with said sheet having also a plurality of folding means for establishing adjacent panel bodies being similar in size;



said reusable aftermarket envelope being constructed by said folding means of said sheet with the envelope being further comprised of at least two panel bodies of said sheet being fixedly adhered to one another by a securing means;

and, a landscape pictorial ad field located on a front side portion of the aftermarket envelope wherein the ad field aligns parallel to a horizontal axis of the envelope's said front side portion for providing a functional at a glance view as to the envelope's most likely accumulating contents.

5,487,567

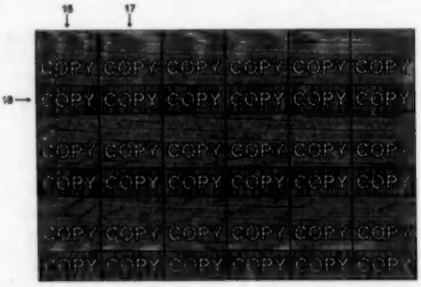
PRINTING METHOD AND COPY-EVIDENT SECURE DOCUMENT

John R. Volpe, Stormville, N.Y., assignor to Francois-Charles Oberthur Group, Paris, France

Filed Apr. 24, 1992, Ser. No. 874,188

Int. Cl.[6] B42D *15/00*

U.S. Cl. 283—72 **51 Claims**



1. A copy evident document which when copied results in a copy with a readily visually perceptible warning indicia that the copy is not an original document comprised of:

a document substrate having a surface;

a composite design on said surface comprised of an image warning design bordered by a background design;

said image warning design and said background design are each comprised of generally parallel printed lines of approximately equal width and depth on said surface with the lines of said image warning design being offset at an angle to the lines of said background design,

said lines of said designs being sufficiently fine in pitch and width so as to make the image warning design difficult to distinguish from the background design on casual inspection of the document with the naked eye while at the same time exploiting a photocopier's or facsimile machine's inability to accurately resolve the composite design, thereby making the image warning design appear readily apparent upon casual inspection of any copy of the document.

5,487,568

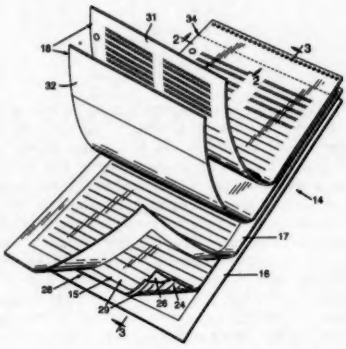
ADHESIVE FORM ASSEMBLY

Richard E. Ipsen, 12365 SW. Katherine St., Tigard, Oreg. 97223

Continuation of Ser. No. 967,287, Oct. 26, 1992. This application Apr. 15, 1994, Ser. No. 228,088

Int. Cl.[6] B42D *15/00*

U.S. Cl. 283—81 **26 Claims**



1. A form assembly for attaching a form to a surface, comprising:

a two-sided form having an outer periphery;

an attachment strip surrounding the outer periphery of the two-sided form and having an inner and outer side, at least one side of the two-sided form removably attached to the attachment strip by a line of weakness;

an adhesive layer on the inner side of the attachment strip; and

a liner strip substantially coextensive with at least part of the attachment strip,

the liner strip being removable from the attachment strip to expose the adhesive layer for adhering the attachment strip and thereby attaching the two-sided form to the surface.

5,487,569

CONNECTOR FOR THREE OR MORE CAPILLARY TUBES

Paul H. Silvis, Boalsburg, and Bradley R. Rightnour, Mingeville, both of Pa., assignors to Restek Corporation, Bellefonte, Pa.

Filed Oct. 12, 1994, Ser. No. 321,973

Int. Cl.[6] F16L *35/00*

U.S. Cl. 285—24 **12 Claims**

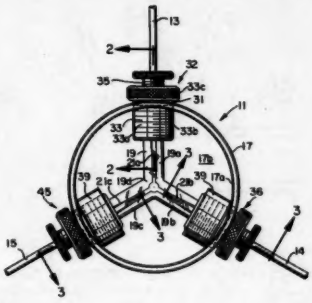
1. An easily-assembled, heat resistant connector (**11**) for releasably joining end portions of three capillary tubes (**13**, **14**, **15**) for use in chromatography without interrupting fluid flow or interfering with chromatographic results, comprising

a main body (**17**) having a cylindrical wall (**17***a*) and an interior space (**17***b*) inside the wall (**17***a*),

a glass insert (**19**) having first (**19***a*), second (**19***b*) and third (**19***c*) hollow legs which are connected together at a central portion (**19***d*) and are spread apart,

each leg (**19***a*, **19***b*, **19***c*) extending outwardly from the central portion (**19***d*) towards an open end portion,

each leg (**19***a*, **19***b*, **19***c*) having an inboard bore (**21***a*, **21***b*, **21***c*) with a taper that receives an end portion of one of the capillary tubes (**13**, **14**, **15**),



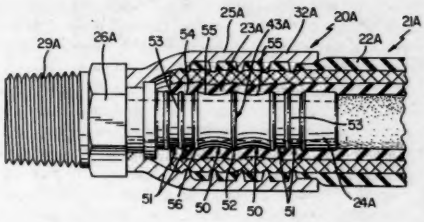
said taper being wider near the open end portion of the leg (**19***a*, **19***b*, **19**c) and narrower near the central portion (**19***d*),
each leg (**19***a*, **19***b*, **19**c) having an outboard bore (**25**) which is larger in diameter than the diameter of the inboard bore (**21***a*, **21***b*, **21**c),
each leg outboard bore (**25**) having an open outer end and an inboard end with a stop shoulder (**27**),
each leg outboard bore (**25**) having an inner surface (**25***a*),
a ferrule (**29**) seated on the stop shoulder (**27**) of each leg (**19***a*, **19***b*, **19**c)
each ferrule (**29**) having a bore for receiving the end portion of one of the capillary tubes (**13**, **14**, **15**),
each ferrule (**29**) being in the shape of a truncated cone with an inboard bottom base (**29***b*) that is wider than its outboard top base (**29**c), and an inboard bottom portion (**29***d*) with a cylindrical side surface,
a number of openings in the main body,
said openings being spaced apart around the wall of the main body,
screw connector assembly means mounted on the main body in said openings and connected to the glass insert legs for holding the glass insert in place, with
a first screw connector assembly (**32**) for controlling sealing pressure including
a first screw support (**33**) having a hollow shaft (**33***a*) with outer threads (**33***b*),
a knurled knob (**33**c) at the outboard end of the shaft (**33***a*) for easily rotating the first screw support (**33**),
an inboard bore (**33***d*) formed in the first screw support (**33**),
said screw support inboard bore (**33***d*) fitting around the open end of the first leg (**19***a*) of the glass insert (**19**),
an outboard bore (**33***e*) of the first screw support (**33**),
said first screw support outboard bore (**33***e*) having inner threads (**33***f*),
a ferrule seated in the cup at the open end portion of the legs,
and an adjusting screw (**35**) having outer threads (**35***b*) for screwing into the inner threads (**33***f*) of the outboard bore (**33***e*) of the first screw support (**33**) and squeezing the ferrule to form seals between the ferrule and the capillary tube and between the ferrule and the legs of the glass insert.

5,487,570

HOSE ASSEMBLY, HOSE COUPLING AND A PART THEREFOR AND METHODS OF MAKING THE SAME

Samuel L. Wilson, Greenfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 180,597, Jan. 13, 1994, Pat. No. 5,382,059. This application Nov. 10, 1994, Ser. No. 337,596
Int. Cl.[6] **F16L** *33/207*
U.S. Cl. 285—256 **14 Claims**



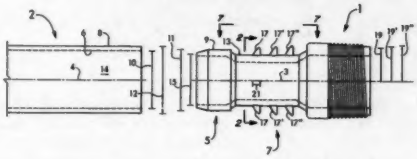
1. In a hose assembly comprising a hose coupling having an annular recess, and a hose having an end thereof clamped in said annular recess of said coupling, said coupling having a longitudinal axis and comprising a tubular insert portion inserted into said one end of said hose and having an external peripheral surface means that is generally parallel to said longitudinal axis, and a tubular ferrule portion disposed in generally concentric and spaced relation about said insert portion to define said annular recess therebetween and having been radially inwardly deformed toward said longitudinal axis to clamp said end of said hose between said ferrule portion and said insert portion after said end of said hose has been received in said annular recess, said external peripheral surface means having a plurality of spaced apart annular ridge means and having a plurality of spaced apart annular groove means therein that are separated from each other by said annular ridge means so that said insert portion has medial groove means intermediate opposite end groove means thereof, the improvement wherein said end groove means are narrower than said medial groove means, said medial groove means comprising a plurality of medial grooves.

5,487,571

PIPE FITTING

Duane D. Robertson, 122 Loveland Way, Golden, Colo. 80401

Filed Aug. 29, 1994, Ser. No. 298,029
Int. Cl.[6] **F16L** *33/20*
U.S. Cl. 285—259 **42 Claims**



1. A pipe fitting and flexible pipe combination:
said flexible pipe being substantially cylindrical about a first axis and having inner and outer surfaces with respective inner and outer diameters and further having at least one open end and
said pipe fitting extending along a second axis and having a pipe sealing portion and a pipe gripping portion, said sealing portion having a substantially cylindrical section with an outer, substantially smooth, cylindrical surface extending about and along said second axis, said outer cylindrical surface having a diameter at least as large as the inner diameter of said flexible pipe, said gripping portion being spaced along said second axis from said sealing portion and having a substantially cylindrical section with an outer, substantially cylindrical surface extending about and along said second axis, said outer cylindrical surface of said gripping portion having a diameter less than the diameter of the outer cylindrical surface of said sealing portion and less than the inner diameter of said flexible pipe, said gripping portion further including a first pair of spikes, said spikes being located substantially 180 degrees apart from each other about said second axis and extending outwardly from the cylindrical surface of said gripping portion, each of said spikes extending

outwardly of said second axis for a distance greater than said cylindrical surface of said sealing portion extends outwardly of said second axis and greater than half the inner diameter of said flexible pipe, said spikes being located along said second axis substantially at a common location relative to said second axis, said cylindrical surface of said gripping portion being substantially smooth and uninterrupted about said second axis between said spikes, said cylindrical sections of said sealing and gripping portions having respective inner, substantially cylindrical surfaces extending about and along said second axis, said inner cylindrical surface of the cylindrical section of said sealing portion having a diameter greater than the diameter of the inner cylindrical surface of the cylindrical section of the gripping portion.

5,487,572

QUICK-CONNECTION COUPLING

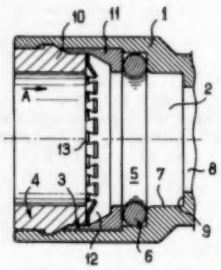
Yves Combot-Courrau, Thorigne Fouillard; Benoît Le Saint, Rennes; Jean-Noël Musellec, Rennes, and Philippe Le Quere, Rennes, all of, France, assignors to Legris S.A., Rennes, France

Filed Mar. 18, 1994, Ser. No. 210,388

Claims priority, application France, Mar. 19, 1993, 93 03198

Int. Cl.[6] F16L *37/084*

U.S. Cl. 285—308 **9 Claims**



1. A coupling device for a tube, the device comprising a body provided with a bore for receiving the end of said tube, and means for retaining the tube in the bore, which means are constituted by an elastically deformable washer that is substantially frustoconical in shape, whose inside circumference is of a diameter smaller than the outside diameter of the tube, and which is subdivided into a plurality of teeth, the outside portion of the washer being disposed in a groove formed in the bore, wherein each tooth possesses a short root portion which, at rest, extends in a radial plane, and an active portion that is inclined relative to the radial plane of the root, and wherein each tooth is an undeformable body connected to the teeth adjacent thereto via elastically deformable peripheral link portions such that deformation of the washer as a whole gives rise to displacement of the teeth without deformation thereof.

5,487,573

UNITARY ASSEMBLY OF TUBING AND A PRESSED ON, INTERFERENCE FIT, TERMINATING FITTING

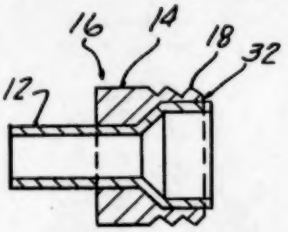
John G. Panek, Churchville, and Richard L. Gottorff, Rochester, both of N.Y., assignors to ITT Corporation, New York, N.Y.

Filed Nov. 19, 1993, Ser. No. 155,460

Int. Cl.[6] F16L *35/00;13/14*

U.S. Cl. 285—332 **4 Claims**

1. A unitary assembly of tubing with a terminating fastener comprising:



a fitting having a tubular opening therein extending through said fitting along a longitudinal axis thereof and an enlarged major inside diameter opening adjacent one end thereof; and

a tube having an enlarged diameter portion adjacent one end thereof, said enlarged diameter portion of said tube having an interference fit within said enlarged major inside diameter opening of said fitting, the fitting and the tube in face-to-face interference fit engagement along an entire longitudinal length of the fitting for preventing axial movement, rotational movement and radial deformation relative to one another.

5,487,574

DOOR OPERATING MECHANISM

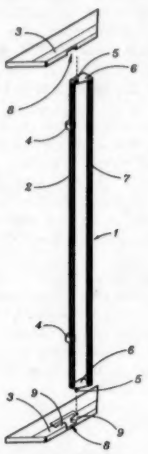
Bo Salling, Skensved, Denmark, assignor to Scanbur A/S, Køge, Denmark

Continuation-in-part of Ser. No. 295,608, Aug. 25, 1994, abandoned. This application Jun. 5, 1995, Ser. No. 463,068

Claims priority, application Denmark, Aug. 25, 1993, 0959/93

Int. Cl.[6] E05C *9/08*

U.S. Cl. 292—218 **4 Claims**



1. An enclosure comprising a plurality of wall members having free edges, including a top wall member, a bottom wall member, a rear wall member, and a pair of side wall members,

a sealing gasket mounted on the free edges of each of said top, bottom, and side wall members,

a door hingedly mounted at one edge thereof to an edge of one of said side wall members,

a door operating mechanism assembly comprising:

a vertical pivot shaft having a longitudinal axis, a central portion and two ends,

two clamps affixed to said door at a free vertical edge thereof, characterized in that one of said clamps is spaced apart from

an upper horizontal edge of said door, and the other of said clamps is spaced apart from a lower horizontal edge of said door, said vertical pivot shaft being rotatably retained in said clamps, said clamps being in spaced relationship from the ends of said vertical pivot shaft,

an eccentric pin mounted at each end of said shaft in fixed relationship thereto and having a first distance measured from the longitudinal axis of said vertical pivot shaft,

lever arm means affixed at one end thereof to an end of said shaft,

handle means affixed to the other end of said lever arm means,

a pair of keeper members mounted one at the edge of said top wall member and the other at the edge of said bottom wall member, each keeper member having an aperture to receive said eccentric pin and a detent provided therein to retain said eccentric pin said detent having a second distance measured from the longitudinal axis of the vertical pivot shaft, as maintained by said clamps,

characterized in that the first distance is larger than the second distance, so that, when said door is closed, said eccentric pins engage the detent of said keeper members, the ends of said vertical pivot shaft are forced inwardly and the central portion of said vertical pivot shaft is bowed outwardly, thereby providing a force clamping said door against the sealing gasket of said enclosure,

whereby said door may be closed and securely engaged against said sealing gasket by grasping said handle means and rotating said vertical pivot shaft until said eccentric pins enter said keeper members and engage the detents thereof.

5,487,575

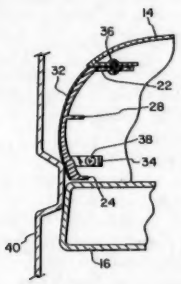
ELECTROPLATED THERMOPLASTIC AUTOMOTIVE GRILLE HAVING IMPROVED FLEXIBILITY

Lee A. Chase, Ada, Mich., assignor to Lacks Industries, Inc., Grand Rapids, Mich.

Division of Ser. No. 99,748, Jul. 30, 1993, Pat. No. 5,452,931. This application May 4, 1995, Ser. No. 434,739

Int. Cl.[6] B62D *25/08;* **B05D** *1/32*

U.S. Cl. 293—115 **7 Claims**



1. A method for forming an automobile grille having a decorative coating so as to promote the flexural properties of said automobile grille, said method comprising the steps of:

forming said automobile grille to have a first segment, a second segment, and a plurality of support members interconnected with said first and second segments, said plurality of support members being formed from a polymeric material having a predetermined flexural modulus, said automobile grille having a first surface, an oppositely disposed second surface, and a side surface intermediate said first surface and said second surface, said first surface defining an outer decorative surface of said automobile grille; and

selectively depositing a metal on said first surface so as to form a decorative metallic layer on said first surface of said automobile grille without substantially forming said decorative metallic layer on said second surface;

whereby said automobile grille is characterized by enhanced flexural properties in the absence of said decorative metallic layer on said second surface, so as to enable said automobile grille to more readily flex when impacted by an object without plastically deforming said automobile grille and without cracking said decorative metallic layer.

5,487,576

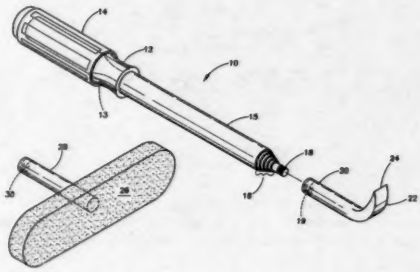
AIR MANAGEMENT SYSTEM FILTER REMOVING TOOL AND METALLIC DEBRIS RETRIEVER

Michael G. DuVivier, 312 Orange Grove St., San Fernando, Calif. 91340

Filed Apr. 25, 1994, Ser. No. 231,844

Int. Cl.[6] B25J *1/00*

U.S. Cl. 294—19.1 **1 Claim**



1. A telescoping retrieval hand tool for retreiving debris and filter screens in air management systems comprising:

a) a handle formed from a group of lightweight and strong materials including carbon composites, KEVLAR, and fiberglass;

a body of the handle;

a grip substantially surrounding the body;

a receiving means located along a longitudinal axis of the body further comprising an elongated hollow tube;

b) a tubular means further comprising:

a first tubular member disposed partially within the receiving means;

a plurality of elongated tube members concentrically aligned within the first tubular member and having a friction fit;

the plurality of elongated tube members capably movable in an axially sliding relative relationship;

c) means for limiting the length of extension of the plurality of elongated tube members further comprising an outwardly facing lip at one end of each of the plurality of elongated members and the first tubular member and an inwardly facing lip at the opposite end of each of the plurality of elongated tube members;

whereby the concentric arrangement of the plurality of elongated tube members allows the outwardly facing lip of an elongated tube member to engage the inwardly facing lip of the elongated tube member in which it is disposed, thereby preventing further axial movement;

d) a plurality of removal tools further comprising:

an elongated ellipsoidal steel magnet selectively and removably attached to the elongated tube having the longest extension;

a hook adapted to engage an edge of a screen when the screen is operatively disposed in an air flow duct, the hook selectively and removably attached to the elongated tube having the longest extension; and

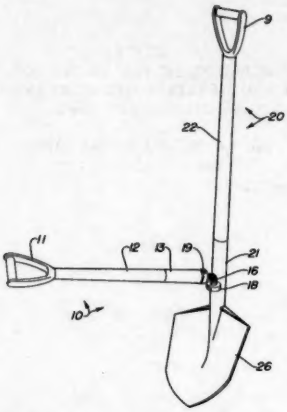
e) the hook and the tubular means being formed from a strong and lightweight material selected from a group of materials including plastic, fiberglass and KEVLAR.

5,487,577

PLIANT UNITARY COUPLING ELEMENT DUAL HANDLED SHOVEL

Randall W. Ball, 178 Laird Cir., Panama City, Fla. 32408

Filed Jun. 27, 1994, Ser. No. 266,976
Int. Cl.[6] A01B 1/22; B25G 3/38
U.S. Cl. 294—58 1 Claim



1. A dual-handled shovel comprising:

a primary handle having a first hand grip on one end and a first metal portion terminating in a shovel blade on the opposing end;

a first spring holding assembly, comprising a first one piece split spring clamp with a threaded center, and a first clamp screw, attached to the first metal portion;

a secondary handle having a second hand grip on one end and a second metal portion on the opposing end;

a second spring holding assembly, comprising a second one piece split spring clamp with a threaded center, and a second clamp screw, attached to the second metal portion; and

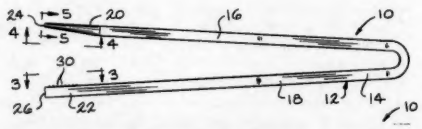
a coil spring having one end secured within the first one piece split spring clamp with a threaded center and its opposing end secured within the second one piece split spring clamp with a threaded center.

5,487,578

TWEEZER APPARATUS FOR USE IN MAKING STUFFED ARTICLES

Charlotte I. Williams, 3653 Jacob Rd., Grass Lake, Mich. 49240

Filed May 2, 1995, Ser. No. 432,684
Int. Cl.[6] A61B 17/30; B25B 9/02
U.S. Cl. 294—99.2 4 Claims



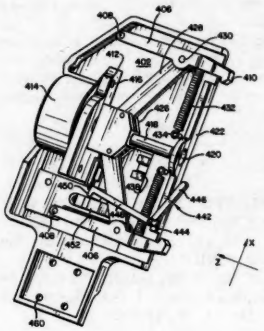
1. Stuffing tweezer apparatus comprising an elongated body member having a handle portion at one end and a pair of generally diverging leg members each having a pair of ends, one of said ends of each of said leg members being integral with said handle portion, each of said leg members being cantilever supported at said one end on said handle portion and terminating in a free working end spaced from said handle portion, the working end of one of said leg members being of a tapered shape and terminating in a point thereby enabling use of the working end of said one leg member to poke stuffing into niches in stuffed objects, the working end of the other one of said leg members terminating in a blunt surface to enable use of said working end of said other one of said leg members to pack stuffing into objects to be stuffed, said leg members being deflectable toward and away from each other to enable use of said leg members to trap stuffing in desired quantities between the tip ends of said leg members when said tip ends are moved toward each other, said trapped stuffing being releasable from a clamped position between the working ends of said leg members when said leg members move away from each other to move said working ends into spaced positions thereby enabling accurate placing of said stuffing into an object being stuffed.

5,487,579

PICKER MECHANISM FOR DATA CARTRIDGES

Daniel J. Woodruff, Lyons, Colo., assignor to Exabyte Corporation, Boulder, Colo.

Filed Aug. 26, 1993, Ser. No. 112,260
Int. Cl.[6] B66C 1/42
U.S. Cl. 294—115 7 Claims



1. A picker mechanism for selectively gripping and transporting a data storage cartridge in an automated library, the picker mechanism comprising:

a picker frame;

a pair of gripper fingers pivotally mounted to the picker frame, each gripper finger having a portion thereof configured to engage a data storage cartridge;

a travelling carriage member;

a path-defining member which defines a displacement path along which the carriage member travels, the path-defining member being mounted to the picker frame;

a motor connected to the path-defining member for driving the carriage member along the path-defining member;

a first biasing spring connected between one of the fingers and the frame for exerting a first biasing force on a first of the pair of gripper fingers in a direction toward the displacement path and a second biasing spring connected between the other finger and the frame for exerting a second biasing force on a second of the pair of gripper fingers in a direction toward the displacement path;

a pair of linkage elements, each linkage element being attached to the carriage member and to a corresponding one of the gripper fingers;

a finger open sensor mounted to the frame for determining when the carriage member is in a first position along the displacement path, the pair of gripper fingers being pivoted to a gripper open position at the first position;

a cartridge presence sensor mounted to the frame for determining when the carriage member is in a second position along the displacement path, the pair of gripper fingers being piv-

oted in the second position to engage the data cartridge with the first biasing force and the second biasing force;

a controller connected to the finger open sensor and to the cartridge presence sensor which actuates the motor to drive the carriage member to a third position along the displacement path, the pair of gripper fingers being pivoted in the third position to a cartridge shove position.

5,487,580

CHUCK UNIT

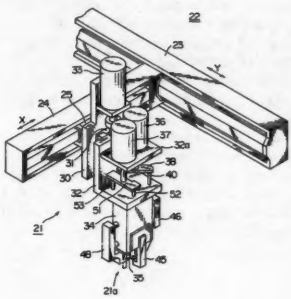
Daisaku Kugo, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 24, 1994, Ser. No. 217,380

Claims priority, application Japan, Mar. 24, 1993, 5-090813

Int. Cl.[6] B25J *15/00;* **B23P** *21/00*

U.S. Cl. 294—119.1 **4 Claims**



1. A chuck unit for chucking and downwardly extruding a workpiece which has two major surfaces, said chuck unit comprising:

a fixing pawl having a first vertical surface for supporting one of said major surfaces of said workpiece and a second vertical surface being perpendicular to said first vertical surface for stopping one side edge of said workpiece;

a first movable pawl being movable oppositely to said first vertical surface of said fixed pawl and having a third vertical surface for pushing the other one of said major surfaces of said workpiece in order to hold said workpiece in association with said first vertical surface of said fixed pawl;

a second movable pawl being movable oppositely to said second vertical surface of said fixed pawl and having a fourth vertical surface for pushing said workpiece against said second vertical surface of said fixed pawl; and

a pusher being vertically movable between said first vertical surface and said third vertical surface for downwardly extruding said workpiece

wherein said fixed pawl has a first vertical groove on said first vertical surface,

said first movable pawl has a second vertical groove on said third vertical surface being opposed to said first vertical groove, and wherein

said pusher vertically moves along a clearance defined by said first vertical groove and said second vertical groove.

5,487,581

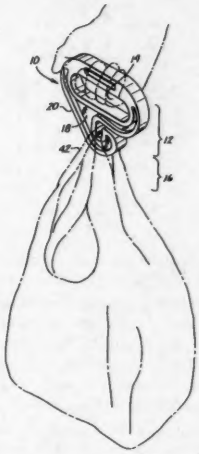
HAND GRIP FOR CARRYING HEAVY PLASTIC BAGS

Robert A. Carmo, 407 Michel Pl., Placentia, Calif. 92670, and Edward A. Contreras, 14110 La Puertas, La Mirada, Calif. 90638

Continuation of Ser. No. 214,747, Mar. 18, 1994, abandoned. This application Apr. 25, 1995, Ser. No. 430,127

Int. Cl.[6] B65D *33/06*

U.S. Cl. 294—137 **3 Claims**



1. An integral hand grip for carrying an article having an extending strap comprising:

a substantially planar body with a first thickness having at least a peripheral reinforcing rib, said peripheral reinforcing rib having a second thickness greater than said first thickness of said planar body, said planar body defining a plane of said grip;

a closed hand hole defined in said body and being defined in said plane of said grip, said hand hole having an interior surface which is smoothed to provide a comfortable grasping surface, said rib circumscribing at least a portion of said hand hole, wherein said body has a substantially solid span disposed above said hand hole when said hand grip is oriented for carrying said article, said solid span providing a rigid element for grasping and having a thickness approximately equal to said second thickness of said rib; and

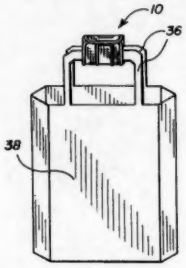
a single smooth edged, rigid hook integrally formed with said body below said hand hole when said hand grip is oriented for use, said hook for receiving said strap from said article to suspend said article from said hand grip when in use, said hook receiving said strap at a first center point within said hook, said hand hole having a second center point center, said first center point of said hook being aligned with said second center point of said hand hole so that said grip is balanced when loaded with said article to permit holding of said grip without substantial torque being applied thereto by said article when said grip is held in its normal orientation, said hook having a hook mouth, said hook mouth being oriented in said direction of said hand hole so that a selected rotation of said grip around an axis perpendicular to said plane of said grip rotates said mouth of said hook downwardly to allow said strap of said article to be unloaded from said grip,

whereby said article may be comfortably carried.

5,487,582
DETACHABLE SHOPPING BAG HANDLE

Barbara S. Bourgeois, and Kim S. Dupuis, both of 3107 Orris La., Apartment 110, Metairie, La. 70002

Filed Dec. 13, 1994, Ser. No. 354,524
Int. Cl.[6] A45C *13/26*; B65D *33/06*
U.S. Cl. 294—146 1 Claim

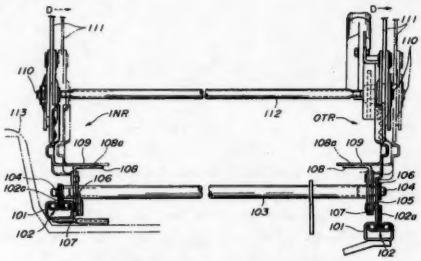


1. A detachable shopping bag handle comprising:
a first substantially rectangular, flexible, woven fabric member having a length between four and ten inches, a width between four and eight inches, and a first and second surface;
a second substantially rectangular, flexible, woven fabric member having a third and fourth surface and having a length and width substantially identical to said first fabric member;
a substantially rectangular, about one-half inch thick, padded portion, having a length and width substantially identical to said first fabric member, disposed between said first surface of said first fabric member and said third surface of said second fabric member and stitched in place with a first stitch set containing at least three substantially parallel lines of stitching and a second stitch set containing at least three substantially parallel lines of stitching, said first stitch set intersecting said second stitch set;
a binding wrapped about an entire first and second perimeter edge, respectively, of said first and second fabric members and stitched in place in a manner such that each stitch in said stitching passes through said binding twice, said first fabric member once, said padded portion once, and said second fabric member once;
a pocket member, constructed from a flexible fabric, attached to said second surface of said first fabric member defining a cavity, between said pocket member and said second surface, extending substantially the entire length of said first fabric member, having an opening running substantially the entire length of said pocket member along a first edge of said pocket member;
a flap member stitched to said second surface of said first flexible member in a manner to cover said opening;
a first section of hook material from a hook and pile type fastener attached to said second surface of said first flexible member;
a second section of pile-material from a hook and pile type fastener attached to said fourth surface of said second flexible member;
an eyelet member, secured through three concentric apertures formed through said first flexible member, said padded portion, and said second flexible member adjacent and centered along a short edge thereof, having an aperture therethrough of sufficient dimensions to allow a ring member to pass therethrough; and
a ring member installed through said aperture said ring member being adapted to pass through a hole formed in a base portion of a key.

5,487,583
LATERALLY ADJUSTABLE AUTOMOTIVE SEAT WITH LIFTER DEVICE

Isao Ikegaya, and Noboru Mochizuki, both of Kosai, Japan, assignors to Fuji Kiko Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1993, Ser. No. 158,309
Claims priority, application Japan, Nov. 30, 1992, 4-082434 U; Nov. 30, 1992, 4-082435 U
Int. Cl.[6] B60N *2/04*
U.S. Cl. 296—65.1 9 Claims

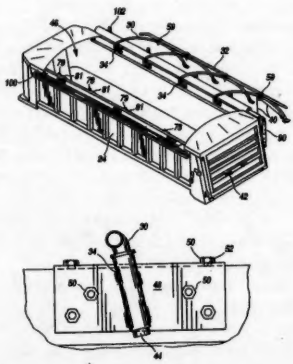


1. A seat for a vehicle having a body, comprising:
a pair of first rails mounted to the body of the vehicle;
a pair of second rails engaged with said pair of first rails, said pair of second rails having wall portions;
a connecting rod rotatably arranged between said wall portions of said pair of second rails;
a pair of links mounted to said connecting rod;
a pair of side brackets rotatably mounted to said pair of links; and
a pair of base plates mounted to said pair of side brackets, said pair of base plates having a bottom having first and second portions and an imaginary longitudinal axis, each portion being formed with at least two through holes at a predetermined interval in a cross direction with respect to said imaginary longitudinal axis of said bottom.

5,487,584
SWING AWAY SUPPORT SYSTEM FOR A COVERING

Lee Jespersen, Jacksonville, Fla., assignor to Wahpeton Canvas Co. South Dakota, Inc., Yankton, S. Dak.

Continuation of Ser. No. 30,681, Mar. 12, 1993. This application Jul. 7, 1994, Ser. No. 271,567
Int. Cl.[6] B60P *7/04*
U.S. Cl. 296—100 18 Claims



1. A structure to support a removable covering over an opening of a body, the structure comprising:

a plurality of bows spanning the opening, each bow having first end pivotally attached to one side of the opening and second end reversibly engaging the opposing side of the opening; and,

connecting means to connect at least two bows to each other, the connecting means being pivotally connected to each connected bow between the first bow end and the second bow end;

whereby the bows may be simultaneously pivoted between a position spanning the opening to a position at least partially retracted from the opening by movement of the connecting means.

13. A structure to support a removable covering over an opening of a body, the structure comprising:

a bow having a first end and a second end; and

pivot means attached to one side of the opening for engaging the first end of the bow to allow pivotal movement about the pivot means;

wherein pivotal movement of the bow relative to the pivot means at least partially lifts the bow from the opening.

5,487,585

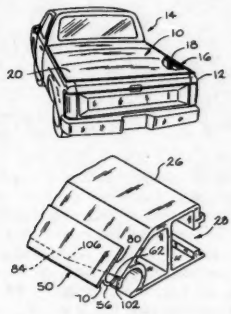
RELEASE FOR FLEXIBLE TONNEAU COVER

Donald G. Wheatley, 4451 Ford Rd., Ann Arbor, Mich. 48105

Filed Sep. 12, 1994, Ser. No. 304,144

Int. Cl.[6] B60P *7/04*

U.S. Cl. 296—100 **10 Claims**



1. A tonneau cover for covering an area of a vehicle, said vehicle area being bounded by spaced sidewalls each having a top surface, said tonneau cover comprising:

a flexible fabric cover having side edges and a central region bounded by said side edges, said side edges being positionable above the vehicle spaced sidewalls so that said cover can extend over the vehicle area to be covered;

a frame having a plurality of elongated rails each having two ends, one of said rails being mounted on the top surface of each vehicle sidewall, at least one of said rails having a flange extending generally away from the vehicle area to a terminal edge, said flange extending a nominal width W;

an elongated fastener having two ends and being attached to said flexible cover along one of said side edges, said fastener having a base attached to said flexible fabric cover and a hook projecting from said base, said hook being formed by a return bend portion extending from said base generally away from said flexible fabric cover and then turning generally toward said central region of said cover forming a bight with a concave inner surface and ending in a distal edge spaced from said fastener base, said return bend portion having a nominal length measured from said base to said distal edge, said fastener being mounted to said frame by placing said bight around said rail flange with said terminal edge of said rail flange being seated in said bight and contacting said concave inner surface along a line of contact spaced from the distal edge of said return bend portion;

said fastener being flexible to enable said return bend portion to be removed from said rail flange by flexing of said fastener to move said line of contact between said rail and said bight toward and past said distal edge of said fastener to remove said cover from said rail; and

one of said return bend portion of said fastener and said flange of said rail being tapered over an end portion of short length adjacent to one end of said fastener and said rail to enable said distal end of said return bend portion to be moved off said rail flange at said one end with reduced relative movement between said fastener and said rail.

5,487,586

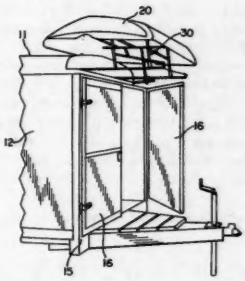
FRAME FOR SECURING A WIND DEFLECTOR TO A TRAILER

James R. Kinkaide, Elkhart, Ind., assignor to Wells Cargo, Inc., Elkhart, Ind.

Filed Jan. 11, 1994, Ser. No. 180,138

Int. Cl.[6] B62D *35/00*

U.S. Cl. 296—180.1 **28 Claims**



1. A frame for attaching a wind deflector to a trailer, comprising:

a first plurality of brackets for attaching said frame to the trailer;

a plurality of vertical pivot tubes attached to said first brackets;

a plurality of horizontal pivot tubes attached to said vertical pivot tubes;

a plurality of vertical support tubes attached to said horizontal pivot tubes; and

a second plurality of brackets attached to said vertical support tubes, said second plurality of brackets for securing the wind deflector to the trailer.

5,487,587

SEAT CUSHION ASSEMBLY REMOVABLY RETAINABLE ON A SEAT SURFACE

Frances G. Hylton, Ruther Glen, Va., assignor to Decorite, Inc., Ashland, Va.

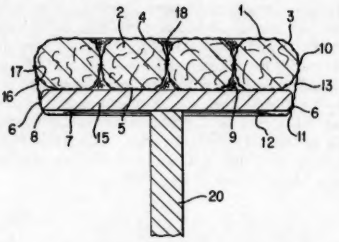
Continuation of Ser. No. 293,192, Aug. 19, 1994, abandoned, which is a continuation of Ser. No. 972,106, Nov. 5, 1992, abandoned, which is a continuation of Ser. No. 704,987, May 24, 1991, abandoned. This application Dec. 19, 1994, Ser. No. 358,683

Int. Cl.[6] A47C *27/00*

U.S. Cl. 297—219.1 **14 Claims**

1. A seat cushion assembly specifically configured for a stool, said stool having a seat with a generally planar, upper support surface and a generally planar, lower surface extending generally parallel with respect to the upper support surface, the lower support surface always being lower than the upper support surface and being joined thereto by a generally vertically extending edge portion, said assembly comprising:

a cushion for placement on said upper support surface of said seat, said cushion comprising an inner cushioning member of cushioning material having an outer perimeter and an outer



cover of a single piece of material surrounding at least an upper surface of said inner cushioning member to provide a single compartment for the material and being connected thereto at said outer perimeter to form an internally beadless seam with said cushioning material being contained in said single compartment, said inner cushioning member and said outer cushioning cover being dimensioned such that said cushion covers substantially the entire upper support surface when the seat cushion is installed on said seat;

a skirt extending from said cushion, the skirt comprising an upper portion connected to said seat cushion at said beadless seam and extending generally vertically over the generally vertically extending edge of the seat; said skirt having a lower portion extending from the upper portion and extending radially inwardly over a substantial portion of the lower surface of said seat for non-positive engagement therewith when said seat cushion is mounted on said seat; and,

an elastic member disposed at said lower portion of said skirt to gather the lower portion of the skirt and hold the skirt in abutment with said generally planar lower surface of said seat.

5,487,588

CHILD SAFETY SEAT

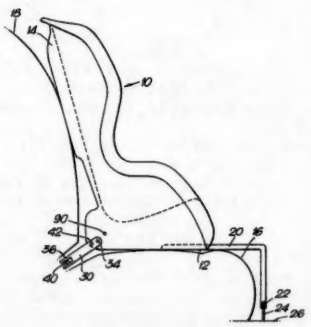
David W. Burleigh, Bognor Regis, England; Waldemar Czernakowski, Blaustein, and Hermann Wetter, Ulm, both of, Germany, assignors to Britax-Excelsior Limited, England, and Britax Romer Kindersicherheit GmbH, Germany

Filed Mar. 22, 1994, Ser. No. 215,808

Claims priority, application United Kingdom, Apr. 8, 1993, 9307446

Int. Cl.[6] B60N *2/28*

U.S. Cl. 297—253 **18 Claims**



1. A child safety seat for use in a vehicle, comprising a seat body having a seat portion and a backrest portion, and a pair of attachment buckles mounted by means of rigid links on opposite sides of the seat body for movement between a first position in which they project rearwardly so as to be engageable with two standard anchorage units on the vehicle which are accessible between a seat portion and a backrest portion of a seat of the vehicle and a second position in which they provide support for guide means for an adult seat belt, releasable means for securing each of the attachment buckles either in its first position or in its second position, and additional releasable means for holding the attachment buckles in an intermediate position in which the adult seat belt is fastened, subsequent movement of the attachment buckles into their second position being arranged to apply additional tension to the adult seat belt.

5,487,589

VEHICLE SEAT

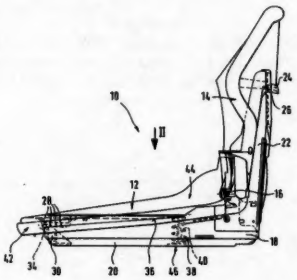
Hermann Meiller, Amberg, and Wolfgang Beier, Rieden, both of, Germany, assignors to Grammer AG, Amberg, Germany

Filed Jan. 23, 1995, Ser. No. 376,780

Claims priority, application Germany, Jan. 26, 1994, 44 02 170.4

Int. Cl.[6] A47C *1/023;1/026*

U.S. Cl. 297—342 **5 Claims**



1. A vehicle seat comprising: a base means having a first portion which in the position of use of the seat is at least substantially horizontal and a second portion which in said position of use of the seat is at least substantially vertical whereby the base means is of an at least substantially L-shaped configuration; a seat plate means on the first portion of the base means and having a front edge portion and a rearward portion; a backrest means pivotably movably connected to the seat plate means are mounted on the second portion of the base means; first retaining members at the underside of said seat plate means at the front edge portion thereof in spaced-apart relationship in the longitudinal direction of the seat; a stationary mounting support means on the first portion of the base means and having a co-operating retaining member for latching engagement with a corresponding first retaining member on said seat plate means; spring elements operatively disposed between said first portion of the base means and said seat plate means at the rearward portion thereof and spaced from each other in the transverse direction of the seat; and a sliding shoe for each spring element, each sliding shoe being slidably movably supported on said first portion of the base means to provide support for the respective spring element against said first portion of the base means.

5,487,590

CHAIR TO PROMULGATE KINESTHETIC THERAPY: APPARATUS AND METHOD

Robin Haynes, 1730 Industrial Dr., Auburn, Calif. 95603

Filed Jun. 30, 1994, Ser. No. 268,785

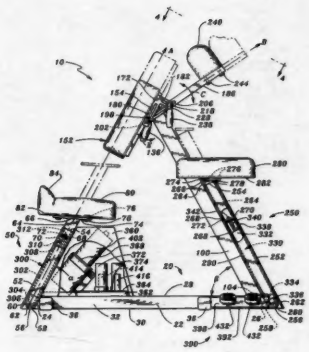
Int. Cl.[6] A47C *1/02*

U.S. Cl. 297—344.14 **16 Claims**

1. A massage chair, comprising, in combination:

a base having a longitudinal extent and longitudinal extremities;

a seat support at one said longitudinal extremity;



a seat fixed horizontally and telescopically supported on said seat support;

chest, arm and face support at another said extremity;

said supports in the same vertical plane and having acute angles facing upwardly and inwardly towards each other but spaced apart at upper extremities thereof defining an open space between an upper surface of said seat and a lower surface of a chest pad;

an arm pad fixed horizontally and telescopically supported on said chest, arm and face support;

said chest pad located on said chest, arm and face support and having means to adjust said chest pad along an axis coincident with said seat support telescoping adjustment; and

a face pad connected to said chest, arm and face support and having axial adjustment means and arcuate adjustment means.

5,487,591

BACK SHELL WITH SELECTIVE STIFFENING

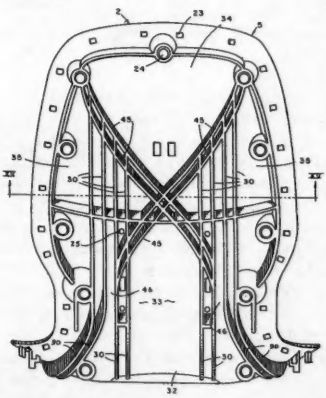
Glenn A. Knoblock, Kentwood, Mich., assignor to Steelcase, Inc., Grand Rapids, Mich.

Continuation of Ser. No. 797,717, Nov. 25, 1991, Pat. No. 5,333,934, which is a continuation of Ser. No. 738,808, Jul. 31, 1991, abandoned, which is a continuation of Ser. No. 850,528, Apr. 10, 1986, Pat. No. 5,050,931. This application May 31, 1994, Ser. No. 252,666

The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.

Int. Cl.[6] A47C *3/12*

U.S. Cl. 297—452.14 **40 Claims**



1. A molded seat back, comprising:

a generally planar shell having a forward surface and a rearward surface, said shell having a plurality of ribs disposed on one of the surfaces to control flexure of the shell, said ribs including:

a plurality of angularly related first ribs, at least one of said first ribs being angled different from another of said first ribs to form a generally X-shaped pattern, said first ribs having upper and lower leg portions defined on opposite sides of the point at which said first ribs intersect; and

a plurality of substantially vertical second ribs, said second ribs being laterally spaced apart, at least a portion of at least one of said second ribs being positioned within the space defined between the upper leg portion of one of said first ribs and the lower portion of another, differently angled, first rib, said upper leg portions of said angularly related first ribs defining therebetween an uninterrupted planar portion of said shell.

5,487,592

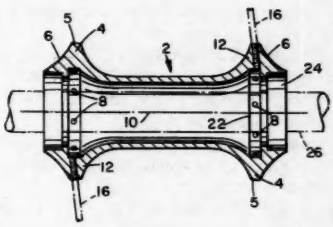
HUB FOR BICYCLE WHEELS

Clark W. Rasmussen, 9584 Fermi Ave., San Diego, Calif. 92123

Continuation-in-part of Ser. No. 844,516, Mar. 2, 1992, abandoned. This application Apr. 30, 1993, Ser. No. 56,352

Int. Cl.[6] B60B *21/06*

U.S. Cl. 301—59 **11 Claims**



1. A hub shell for a spoked bicycle wheel comprising:

a hollow, generally-cylindrical body having a spoke flange with a perimeter face and a hub head at each end thereof and an axis running through a center of said body, said perimeter face being angled inwardly with respect to said axis wherein said spoke flange on one end of said body is wider than said spoke flange on the other end of said body;

an annular recess at each said end for retaining a bearing means; and

a plurality of bores distributed radially around said spoke flange directed inwardly at an angle from said spoke flange, said bores having internal threads for mating win an external thread of a spoke wherein said spoke is threaded at both ends, a first end for attachment to said hub head and a second end for attachment at a rim of said bicycle wheel, wherein said plurality of bores on the one end of said spoke flange is positioned around said perimeter face in a staggered arrangement and said angle is 3.5°±1°.

5,487,593

ANTI-LOCK BRAKING SYSTEM PROVIDING PUMP MOTOR DUTY CYCLE BASED ON DECELERATION AND MOTOR VOLTAGE FEED BACK

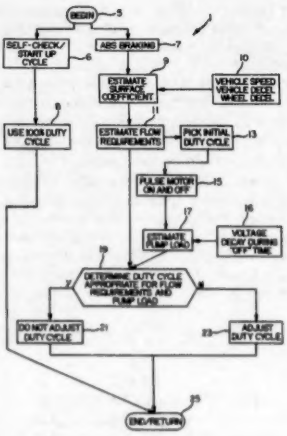
Jeffrey R. Potts, Grangier; Charles E. Lindenman, and Thomas A. Grana, both of South Bend, all of Ind., assignors to AlliedSignal Inc., Morristown, N.J.

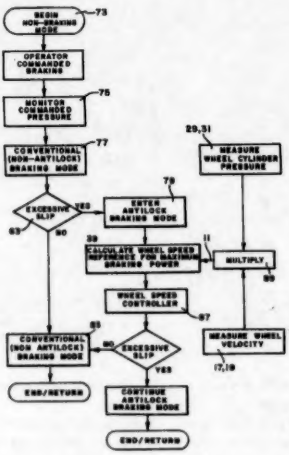
Filed Nov. 23, 1994, Ser. No. 344,766

Int. Cl.[6] B60T *13/18*

U.S. Cl. 303—11 **10 Claims**

1. A method of determining a duty cycle of a pump motor in an anti-lock braking system of a vehicle, comprising the steps of:





a. determining that the mode of braking is during anti-lock braking,

b. utilizing estimated calculated vehicle deceleration and wheel deceleration to estimate the coefficient of friction of a surface engaged by wheels of the vehicle,

c. estimating pump flow requirements for said pump motor,

d. selecting an initial duty cycle for the pump motor,

e. pulsing the pump motor on and off in accordance with the selected initial duty cycle,

f. utilizing decay voltage of the pump motor when the pump motor is deactivated to estimate a pump load requirement imposed on the motor,

g. determining if the selected initial duty cycle is sufficient to provide the estimated pump flow requirements and the pump load requirement, and

h. controlling operation of the pump motor by changing, as necessary, the duty cycle.

5,487,594

METHOD FOR UPDATING A WHEEL REFERENCE VALUE BY ASSESSING PROXIMITY FOR THE BRAKING POWER CURVE PEAK

Michael J. Schneider, Bloomfield Township, Mich., assignor to AlliedSignal Inc., Morristown, N.J.

Filed Nov. 30, 1994, Ser. No. 346,726

Int. Cl.[6] B60T *8/00*

U.S. Cl. 303—155 **12 Claims**

1. In the control of a vehicle anti-lock braking system of the type utilizing measured wheel velocity and computed wheel reference values to control braking torque, the method of searching for maximum braking power comprising the steps of:

determining (**125**) on which side of the peak of a braking power curve the vehicle is operating if the vehicle is not operating at the peak of the braking power curve;

incrementing (**129**, **117**) a prior wheel reference value by an amount which changes the prior wheel reference value toward the peak of the braking power curve thereby calculating an updated wheel reference value (**119**); and

utilizing (**127**) the updated wheel reference value to control appropriately the braking torque of a wheel.

5,487,595

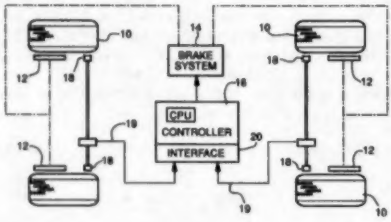
DUAL HYSTERESIS METHOD OF GENERATING SQUARE WAVES FROM AUTOMOTIVE WHEEL SPEED SIGNALS

William D. Wise, Flora; Marc L. De Wever; Dale J. Kumke, both of Kokomo; Everett R. Lumpkin, Galveston; Matthew D. Sale, and Brian W. Schousek, both of Kokomo, all of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Feb. 28, 1994, Ser. No. 203,097

Int. Cl.[6] B60T *8/60*; G01P *3/489*

U.S. Cl. 303—168 **3 Claims**



1. In an automotive vehicle control using wheel speed information and having a plurality of wheel speed sensors each producing an analog signal having a frequency proportional to its respective wheel speed and subject to single cycle anomalies, a method of generating square waves for each sensor having the same frequencies as the corresponding analog signals comprising the steps of:

periodically sampling and digitizing the analog signals one at a time to sequentially produce digital values comprising a series of digital values for each of the sensors;

sequentially evaluating the digital values to identify peaks and valleys in each of the signals by comparing each digital value to the previous value in the same series;

applying a dual hysteresis method to each series of digital values to trigger square wave transitions following each peak and valley, thereby generating a square wave corresponding to each digital series.

5,487,596

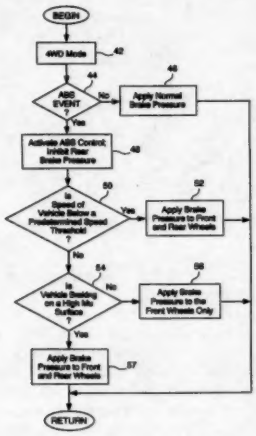
METHOD AND SYSTEM FOR CONTROLLING REAR WHEEL ANTI-LOCK BRAKE CONTROL ON FOUR-WHEEL DRIVE VEHICLES BRAKING ON HIGH MU SURFACES

Dan Negrin, Wiesbaden, Germany, assignor to Kelsey-Hayes Company, Livonia, Mich.

Continuation-in-part of Ser. No. 303,453, Sep. 9, 1994, abandoned. This application Mar. 14, 1995, Ser. No. 403,428

Int. Cl.[6] B60T *8/64*

U.S. Cl. 303—149 **20 Claims**



1. A method for controlling an antilock brake system in a four-wheel drive vehicle having front and rear wheels during an anti-lock braking event, the method comprising:

determining whether the vehicle is braking on a high mu surface; and

inhibiting application of brake pressure to the rear wheels until the vehicle is braking on a high mu surface.

5,487,597

HYDRAULIC CIRCUIT WITH A CAPACITY FORMING A DISTRIBUTOR

Pierre Lebret, Le Chesnay, France, assignor to AlliedSignal Europe Services Technique, Drancy, France

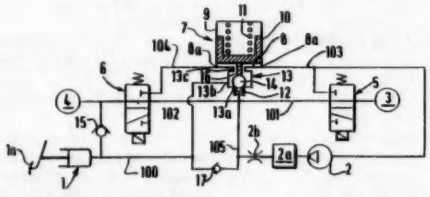
PCT No. PCT/FR94/00466, § 371 Date May 20, 1994, § 102(e) Date May 20, 1994, PCT Pub. No. WO94/27849, PCT Pub. Date Dec. 8, 1994

PCT Filed Apr. 23, 1994, Ser. No. 244,168

Claims priority, application France, May 25, 1993, 93 06181

Int. Cl.[6] B60T *13/18*

U.S. Cl. 303—116.2 **8 Claims**



1. A hydraulic brake circuit for a motor vehicle provided with at least an electrically pilot-controlled braking function, and including at least a master cylinder, an electric pump, first and second brake motors, first and second respective solenoid valves, and a low-pressure capacity comprising a variable volume accumulation chamber connected to a remainder of the circuit by an inlet and defined within a cylinder by a piston which is stressed toward the inlet by means of a first spring generating a first force acting in a direction capable of reducing the volume of the chamber to a minimum value, characterized in that the capacity furthermore comprises an access chamber having first and second inlets and an outlet communicating with the inlet of the accumulation chamber, in that a sealing member, which can move between first and second extreme positions, is arranged in the access chamber in order to seal selectively the first inlet of the access chamber in a first position, and the outlet of the access chamber in a second position, in that the sealing member is placed selectively in the first position by the first spring acting on the sealing member by means of the piston when the volume of the accumulation chamber is close to the minimum value, in that the sealing member is placed in the second position by a second spring acting counter to the first spring and generating a second force which is smaller than the first force, when the volume of the accumulation chamber is substantially greater than the minimum value, and in that the second inlet is in permanent communication with an inside of the access chamber.

5,487,598

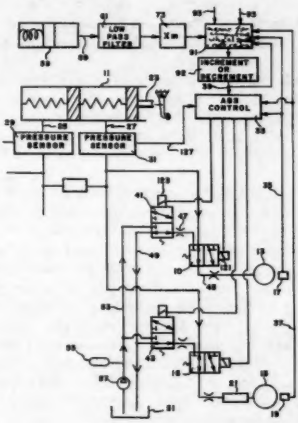
VARIABLE DUTY CYCLE ANTILOCK BRAKING SYSTEM WITH ACCELEROMETER

Robert M. Rivard, West Bloomfield; Michael J. Schneider, Bloomfield Township, both of Mich.; Tamas I. Pattantyus, Elyria, Ohio; Kenneth S. Towers, Granger, Ind., and Jack R. Phipps, Bristol, Tenn., assignors to AlliedSignal Inc., Morristown, N.J.

Filed Dec. 12, 1994, Ser. No. 353,861

Int. Cl.[6] B60T *8/32*

U.S. Cl. 303—166 **9 Claims**



1. A method of calculating wheel speed reference for the control of a vehicle antilock braking system comprising the steps of:

measuring (**59**) the current vehicle deceleration;

repeatedly computing (**73**) the force causing the vehicle deceleration utilizing the measured vehicle deceleration;

repeatedly computing a wheel speed reference by determining the sign (**87**) of the ratio of the most recent change in computed force to the most recent change in computed wheel speed reference, and updating a previously computed wheel speed reference by incrementing (**92**) that previous reference by a first amount in the event the sign of the determined ratio is positive, and decrementing (**92**) that previous reference by a second amount in the event the sign of the determined ratio is negative to define a current wheel speed reference; and

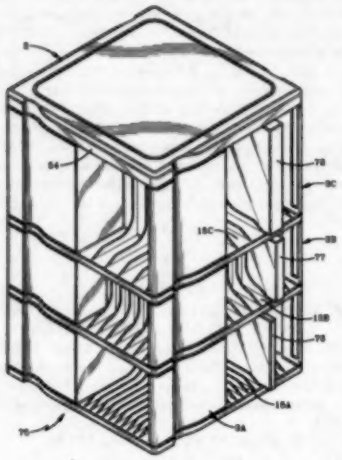
controlling (**33**) the braking system as a function of said current wheel speed reference.

5,487,599

STORAGE CABINET FOR RECORDED MEDIA

James T. Weisburn, Massillon, and Christopher G. Gallagher, Akron, both of Ohio, assignors to Alpha Enterprises, Inc., North Canton, Ohio

Filed Sep. 16, 1994, Ser. No. 308,115
Int. Cl.[6] A47B *81/06*
U.S. Cl. 312—9.46 **16 Claims**



1. A storage cabinet for recorded media including:

a plurality of polygonal-shaped cabinet modules arranged in a vertical stacked relationship, each module having four sides, with a storage compartment being formed in certain sides thereof;

a first attachment device provided on an upper portion of each of said modules, said first attachment device includes a plurality of flexible fingers extending upwardly from the upper portion of the module adjacent certain corners thereof, each of said fingers being formed with an opening forming a first locking member;

a second attachment device provided on a bottom portion of each of said modules adaptable for mating engagement with the first attachment device of a lower module to secure said modules in a stacked relationship, said second attachment device includes a plurality of openings formed in the bottom portion of the module adjacent certain corners thereof for receiving the flexible fingers of the adjacent module therein, and a nub being formed within each of said openings of the bottom portion of the module and extending into the openings of said flexible fingers for forming a second locking member;

a top cover having an attachment device engageable with the first attachment device of an uppermost module to secure said cover on said uppermost module;

base means mounted on the bottom portion of a lowermost module for rotatably supporting the plurality of stacked modules on a support surface; and

mounting means for mounting the base means on the bottom portion of said lowermost module.

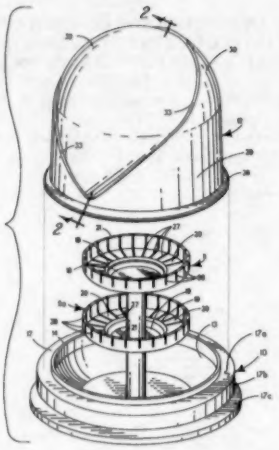
5,487,600

CONTAINER FOR EARRINGS AND SMALL JEWELRY

Brenda G. Griffin, P.O. Box 288, Sagle, Iowa 83860

Filed Jan. 9, 1995, Ser. No. 370,099
Int. Cl.[6] A47F *3/10*
U.S. Cl. 312—135 **3 Claims**

1. A covered container for earrings and small jewelry, comprising in combination:



a base defining a container dish with upstanding rim supported by an annular peripheral skirt structurally communicating with the upstanding rim of the container dish and depending therefrom to define a lower rim for support on an underlying supporting surface, said container dish having in its medial portion an upstanding cylindrical fastening column;

a storage tray having a medial tray dish with a peripheral upstanding rim having an upper edge, said upstanding rim structurally supporting a radially outwardly extending annular support shelf having an upstanding rim thereabout,

said annular support shelf defining a plurality of spaced radially extending channels,

said upstanding rim of the annular support shelf defining a plurality of vertical channels extending from the upper edge of the rim into spaced adjacency with the annular support shelf and aligned with each channel defined in the support shelf, and

said storage tray having a depending tubular support column defining a cylindrical channel for rotatable support on the fastening column of the container dish; and

a cover having a lower rim adapted to fit about the upstanding rim of the container dish and upon the peripheral skirt of the base, said cover having a medial body portion and hemispherical top portion to define an internal chamber to contain the storage tray when the cover is positioned on the base.

5,487,601

BASEBALL CARD STORAGE AND PROTECTION DEVICE

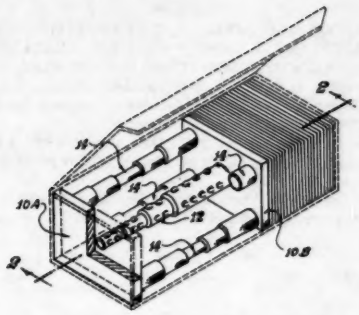
John F. Lucardie, 713 San Antonio Dr., Covina, Calif. 91723

Filed Jul. 28, 1993, Ser. No. 98,954
Int. Cl.[6] A47B *63/00*
U.S. Cl. 312—183 **1 Claim**

1. A protection device for use in a baseball card storage box, comprising:

a first plate and a second plate, each plate having at least four corners,

a connector made up of five close fitting, telescoping tubular, parts fitted one part into another and two end parts, each end part perpendicularly fastened to the center of one of said end plates, said connector being extendable and retractable along an axis of said connector when said end plates are pulled away or pushed toward each other, said tubular parts of said connector having an outside and an inside, said outside being provided with molded bubbles on the outside and cavities on the inside into which said bubbles can be snugly positioned to



secure said end plates apart at discrete distances when said end plates are pulled apart or pushed together,

four telescoping guide tubes connected to said end plates one of said telescoping guide tubes at each of said corners, said telescoping guide tubes being movable longitudinally between an extended position and a retraced position, said telescoping guide tubes being provided with molded annular shoulder stops to prevent the device from being pulled apart.

5,487,602

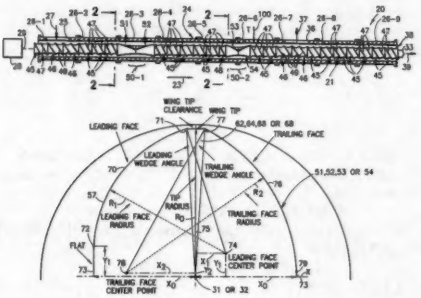
MULTI-SCREW, EXTRUSION-COMPOUNDING MACHINE WITH MODULAR MIXING ELEMENTS

Lefteris N. Valsamis, Stratford; Eduardo L. Canedo, Beacon Falls; Jose M. Pereira, Bridgeport, and Douglas V. Poscich, East Hampton, all of Conn., assignors to Farrel Corporation, Ansonia, Conn.

Filed Jun. 3, 1994, Ser. No. 253,397

Int. Cl.[6] B29B *7/48*

U.S. Cl. 366—81 **22 Claims**



1. A multi-screw extrusion-compounding machine comprising:

a housing assembly including two adjoining and substantially cylindrical barrel sections each having an inner wall surface;

an extrusion-compounding screw disposed within each of said adjoining barrel sections with the screws being axially adjacent each other and rotatable in the same direction about an axis of rotation;

each screw including a plurality of transport screw elements removably mounted on and keyed to a rotationally drivable shaft;

said transport screw elements intermeshing;

each screw including at least one set of non-symmetrical modular mixing elements;

each modular mixing element being removably mounted on and keyed to said shaft;

each modular mixing element having a plurality of non-symmetrical wings;

said modular mixing elements intermeshing; and

each set of said non-symmetrical modular mixing elements including at least one modular mixing element having a left-hand-twist mounted immediately downstream and contiguous with at least one modular mixing element having a right-hand twist.

5,487,603

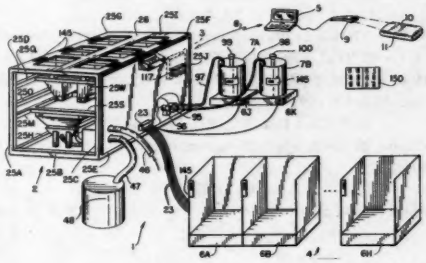
INTELLIGENT SYSTEM AND PROCESS FOR AUTOMATED MONITORING OF MICROINGREDIENT INVENTORY USED IN THE MANUFACTURE OF MEDICATED FEED RATIONS

Charles H. Hoff, Ault, Colo., and Bernard J. Bergen, Encinitas, Calif., assignors to Lextron, Inc., Greeley, Colo.

Filed Feb. 28, 1994, Ser. No. 203,017

Int. Cl.[6] B01F *15/04*

U.S. Cl. 366—141 **36 Claims**



1. A programmable microingredient dispensing and mixing machine, comprising:

a housing of rugged construction; programmed control means for controlling the operation of various components of said machine in accordance with a control program;

an information storage and processing means for storing and processing information relating to the measured weight of microingredients in said machine;

a plurality of dispensing bins disposed in said housing, each said dispensing bins including

means for storing a supply of a preassigned type of microingredient, and

means for dispensing a specified amount of said preassigned type of microingredient from said dispensing bin for weight measurement under the control of said programmed control means;

first weight measuring means for independently measuring the weight of microingredient stored in each one of said dispensing bins under the control of said programmed control means, and producing first weight information for storage in said programmed information storage and processing means, said first transmitted weight information being representative of the measured weight of the microingredients stored in each one of said dispensing bins;

a weigh hopper, disposed within said housing, and for temporarily storing an amount of microingredient dispensed from one of said dispensing bins, into said weigh hopper, said weigh hopper including means for discharging said measured amount of microingredient under the control of said programmed control means;

second weight measuring means, disposed in said housing, for measuring the amount of microingredient stored in said weigh hopper and producing second weight information for storage in said information storage and processing means, said second weight information being representative of the weight of said measured amount of microingredient stored in said weigh hopper; and

a mixing tank for containing one or more types of microingredient discharged from said weigh hopper under the control of said programmed control means, said mixing tank including

means for mixing said discharged microingredients with a specified amount of consumptive fluid carrier, such as water, to form a microingredient slurry mixture, and

means for transporting said microingredient slurry mixture away from said mixing tank under the control of said programmed control means, for subsequent usage.

5,487,604

MULCH RECEIVING BIN AND METHOD OF USING SAME

Ronald S. Moran, 21 Porter Street, Ryde, NSW 2112, Australia

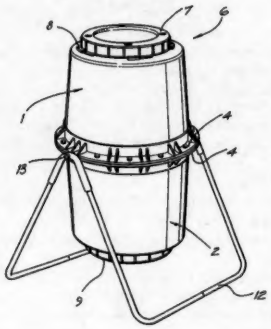
PCT No. PCT/AU92/00591, § 371 Date Apr. 29, 1994, § 102(e) Date Apr. 29, 1994, PCT Pub. No. WO93/09044, PCT Pub. Date May 13, 1993

PCT Filed Oct. 30, 1992, Ser. No. 232,201

Claims priority, application Australia, Jan. 31, 1991, PK 9254

Int. Cl.[6] B01F *9/06*

U.S. Cl. 366—225 **20 Claims**



1. A rotatable mulch bin, comprising:

a pair of drum members, each drum member having an open end provided with a joining flange and an opposite closed end;

at least one of said pair of drum members having an openable closure member disposed at said opposite closed end;

said pair of drum members being interconnected together at the joining flanges so that the opposite ends are disposed spaced apart from one another for helping to define a garden waste receiving bin;

members including a breaker bar and defining a pivot axis extending diametrically through the interconnected joining flanges for breaking up clumps of garden waste;

bearing means disposed on said drum members for supporting rotatably said bar to help facilitate the substantially free rotation of the bin about said pivot axis; and

a support stand for supporting from below said bar, said bar being supported so that said bin is rotatable about said pivot axis to cause the garden waste to fall under the force of gravity against the breaker bar to facilitate mulching the waste.

5,487,605

PROCESS AND DEVICE FOR THE CONTINUOUS BLENDING OF LIQUID AND/OR POURABLE MATERIALS INTO FOODSTUFF MASSES

Gunter Zehle, Bergholz; Hubert Juhnke, Potsdam, and Thomas T. Ismar, Köln, all of, Germany, assignors to Ismar Maschinen GmbH, Cologne, Germany

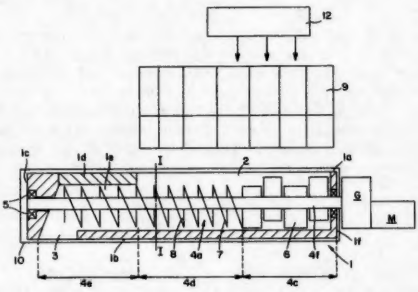
PCT No. PCT/EP92/00705, § 371 Date Apr. 11, 1994, § 102(e) Date Apr. 11, 1994, PCT Pub. No. WO92/17069, PCT Pub. Date Oct. 15, 1992

PCT Filed Mar. 30, 1992, Ser. No. 122,460

Claims priority, application Germany, Mar. 29, 1991, 41 10 416.1

Int. Cl.[6] B01F *7/04*

U.S. Cl. 366—300 **26 Claims**



1. A process for continuous mixing of liquid, pourable, or lumpy substances into basic foodstuff masses said process comprising, introducing said substance into a mixing container which receives the basic foodstuff mass and rotating at least two helicoidal screws in opposite directions to convey a resulting mix horizontally in an axial direction along a mixing line, wherein each of said at least two screws has a circular cross-section and perimeters which overlap in part with perimeters of the other screws, and further comprising introducing different substances at different axial locations of the mixing line.

5,487,606

MIXER FOR DOUBLE CARTRIDGE DISPENSER

Wilhelm A. Keller, Obstgartenweg 9, CH-6402 Merlischachen, Switzerland

Filed Aug. 23, 1993, Ser. No. 110,707

Claims priority, application European Pat. Off., Aug. 24, 1992, 92810645

Int. Cl.[6] B01F *5/06;* **B67D** *5/56*

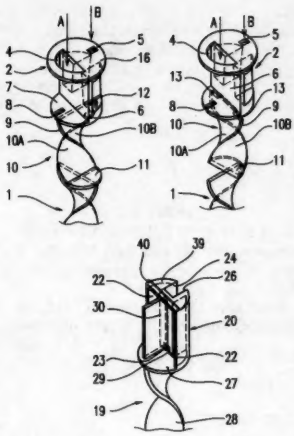
U.S. Cl. 366—339 **19 Claims**

1. A mixer for a double cartridge dispenser, comprising:

a mixer housing which is attachable to said dispenser; and

a mixing helix group which is arranged in said mixer housing, said mixing helix group having an inlet portion for communicating with two dispensing openings of said dispenser;

said inlet portion being divided into a larger inlet chamber for receiving a first component having a greater dispensing volume from a first cylinder of the dispenser and a smaller inlet chamber for receiving a second component having a smaller dispensing volume than said first component from a second cylinder of the dispenser, said larger inlet chamber being larger than said smaller inlet chamber, and said mixing helix group comprising a first means for stemming a flow of said first component through said mixing helix group and a second means for supplying a stemmed flow of said first component to said smaller inlet chamber for carrying the second component along with the first component through the mixing helix group.

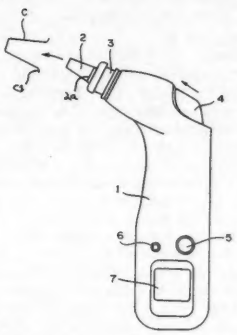


5,487,607

RADIATION CLINICAL THERMOMETER

Shigeru Makita; Yoshihiko Sano, both of Kyoto, Japan; Yasushi Nakamura, Irvine, Calif., and Hiroyuki Ota, Shiga, Japan, assignors to Omron Corporation, Kyoto, Japan

Continuation-in-part of Ser. No. 45,054, Apr. 7, 1993, abandoned. This application Dec. 29, 1993, Ser. No. 176,459
Claims priority, application Japan, Apr. 8, 1992, 4-86738
Int. Cl.[6] G01K *1/08*; G01J *5/02*
U.S. Cl. 374—158 13 Claims



1. A radiation clinical thermometer comprising:

a body housing;

a temperature measuring circuit secured in said body housing;

a probe secured to said body housing;

a temperature sensor disposed in said probe;

a power supply secured in said body housing and connected in circuit with said temperature measuring circuit and said temperature sensor;

means for detecting if a probe cover is mounted on said probe;

means, operatively connected to said detecting means, for determining a condition to enable operation of said thermometer; and

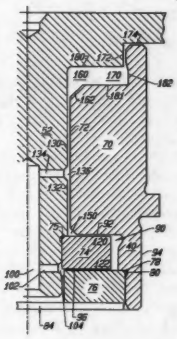
means, operatively connected to said determining means, for enabling operation of said thermometer.

5,487,608

SINGLE PLATE HYDRODYNAMIC BEARING WITH SELF-BALANCING FLUID LEVEL AND FLUID CIRCULATION

Hans Leuthold; David J. Jennings, both of Santa Cruz; Wesley R. Clark, Watsonville; Raquib Khan, Pleasanton, and Guenther Heine, Aptos, all of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Jul. 22, 1994, Ser. No. 278,754
Int. Cl.[6] F16C *17/10*
U.S. Cl. 384—113 24 Claims



1. A spindle comprising an electromagnetic motor and a bearing system, said bearing system comprising a sleeve and a shaft fitted into an axial bore or bushing of said sleeve, said shaft and said bushing rotating freely relative to each other, said shaft defining together with said bushing a journal bearing; said shaft further supporting an annular thrust plate, said thrust plate extending into a recess formed by an axial face stepped into said sleeve and a counterplate parallel to said thrust plate and attached to said sleeve, and said axial face defining together with the adjacent thrust plate surface a first thrust bearing, and the gap between said thrust plate and said counterplate forming a second thrust bearing, both thrust bearings opposing each other; furthermore, said counterplate defining a bore concentric to said shaft, said shaft ending within said bore of said counterplate, said bore in said counterplate being closed off by a shield on the side opposing the stump of said shaft, thus creating a fluid filled bearing system which is open only on one end; said shaft further comprising an axial center bore serving as a reservoir for fluid for said fluid filled bearing system, said center bore communicating with said journal bearing through a first radial bore terminating adjacent said bushing defining said journal bearing, and with said thrust bearing through a flowpassage defined by gaps around said stump of the shaft of by a second radial bore in said shaft terminating adjacent to said second thrust bearing.

5,487,609

SLIDE UNIT FOR LINEAR MOTION

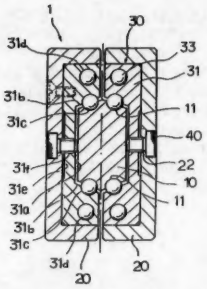
Makoto Asada, Kurokawa, Japan, assignor to THK Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 961,721, Mar. 11, 1993, abandoned. This application Nov. 8, 1994, Ser. No. 339,280
Claims priority, application Japan, May 13, 1991, 3-042344 U
Int. Cl.[6] F16C *29/06*
U.S. Cl. 384—18 10 Claims

1. A linear motion slide unit comprising:

an elongated inner rail;

said elongated inner rail having at least one first side rolling member groove extending along the length of said inner guide rail on a first side of a width of said inner guide rail;



said elongated inner guide rail having at least one second side rolling member groove extending along the length of said inner guide rail on a second side, opposite to said first side, of the width of said inner guide rail;

a first outer rail attached to said first side of said elongated inner rail and reciprocally movable in an axial direction of said inner rail along said first side thereof;

a second outer rail attached to said second side of said elongated inner rail and reciprocally movable in the axial direction of said inner rail along said second side thereof;

at least one first side linear motion guide fixedly secured to said first outer rail and supported slidable with respect to the inner rail through a number of rolling members, said first side linear motion guide being formed with endless tracks in which the rolling members are endlessly circulated, said rolling members being supported along said first side rolling member groove;

at least one second side linear motion guide fixedly secured to said second outer rail and supported slidable with respect to the inner rail through a number of rolling members, said second side linear motion guide being formed with endless tracks in which the rolling members are endlessly circulated, said rolling members being supported along said second side rolling member groove; and

whereby said first side linear motion guide and said second side linear motion guide each are located on opposite sides of said inner guide rail from one another.

5,487,610

WHEEL FOR ROLLER DRAWER GUIDES

Horst Lautenschläger, Reinheim, Germany, assignor to MEPLA-Werke Lautenschläger GmbH & Co. KG, Germany

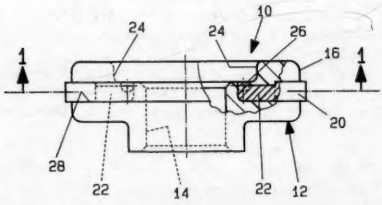
PCT No. PCT/EP94/01375, § 371 Date Jan. 18, 1995, § 102(e) Date Jan. 18, 1995, PCT Pub. No. WO94/26147, PCT Pub. Date Nov. 24, 1994

PCT Filed Apr. 29, 1994, Ser. No. 374,516

Claims priority, application Germany, May 18, 1993, 9307532 U

Int. Cl.[6] A47B *88/00*

U.S. Cl. 384—19 **6 Claims**



1. A wheel for roller drawer guides for extractable furniture parts, having a wheel body of stable shape mountable for rotation on an axle, which wheel body has a circumferential groove the circumferential groove having at least one recess, and a tire of elastically deformable material projecting slightly outward of the circumference of the wheel body, which tire is formed in the groove in a fluid state, wherein an annular groove opens from a lateral surface of the wheel body and the recess is formed as at least one passage running from the circumferential groove to the annular groove.

5,487,611

SEALING SYSTEM FOR A BEARING

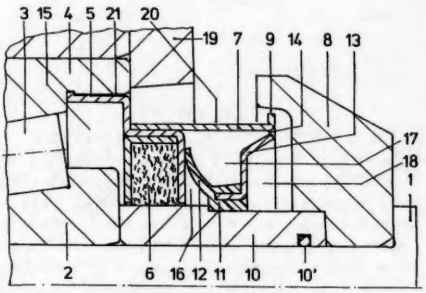
Peter Dreschmann, Dittelbrunn, and Wilhelm Walter, Oberthulba, both of, Germany, assignors to FAG Kugelfischer Georg Schafer AG, Germany

Filed May 13, 1994, Ser. No. 242,434

Claims priority, application Germany, Jan. 21, 1994, 9400995 U

Int. Cl.[6] F16C *33/78*

U.S. Cl. 384—478 **13 Claims**



1. A sealing system for a roller bearing, wherein the roller bearing comprises an axle, an inner bearing race on the axle, bearing rollers around the inner race and an outer bearing race around the bearing rollers;

the inner and outer races having an axial end;

said system comprising a sealing cap axially spaced from the same respective axial end of the inner and outer races;

a first sealing ring sealingly mounted to the outer race, spaced radially out from the inner race; the first sealing ring including an axial area enclosing a bore and extending toward an axial outer end of the first sealing ring that is spaced from the sealing cap a short enough distance as to define a sealing gap between the axially outer end of the axial area of the first sealing ring and the sealing cap;

a felt ring disposed within the bore defined by the axial area of the first sealing ring and located axially out from the end of the inner race; the felt ring being axially spaced away from the bearing rollers as to define a first grease holding chamber axially between the bearing rollers and the felt ring and a second grease holding chamber axially outward of the felt ring;

a second sealing ring located axially outward of the felt ring and including a sealing lip thereon which seals at the felt ring such that the felt ring and the sealing lip may rotate with respect to each other;

the sealing lip from the second sealing ring closing the second grease chamber which is axially outward of the felt ring;

the first sealing ring and the felt ring are mounted to the outer race to rotate with the outer race;

a slinger disk located axially outward of the sealing lip and extending radially outward in the bore within the axial area of the first sealing ring, the slinger disk extending a radial distance as to define a second sealing gap between the axial area of the first sealing ring outward of the slinger disk and the slinger disk;

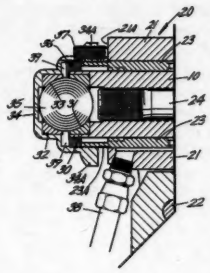
the slinger disk being so placed in the axial area and with reference to the second sealing gap defined by the slinger disk as to define respective first and second trapping chambers on opposite axial sides of the slinger disk.

5,487,612

SHAFT SUPPORTING BEARING ASSEMBLY WITH AXIALLY DISPOSED CAP AND BALL MEMBER

Ronald L. Anderson, 410 Chambers St., Eugene, Oreg. 97402

Filed Nov. 28, 1994, Ser. No. 345,130
Int. Cl.[6] F16C *19/00*
U.S. Cl. 384—501 10 Claims



1. A bearing assembly for supporting a shaft against radial and thrust loads and including,

a housing having a bushing to receive the shaft,

a first bearing ring for installation in the shaft end,

a cap offset from said one end of said shaft,

a second bearing ring housed in said cap,

a ball element carried by said first and second bearing rings and concentric with said shaft whereby radial and thrust loads applied to said shaft are borne by said ball element and said first and second bearing rings, and

bearing adjustment means on said cap and said housing, and

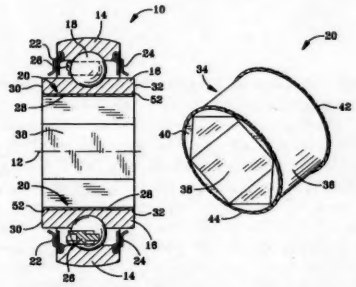
a locking element carried by said cap for seated engagement with said housing.

5,487,613

ADAPTOR FOR INNER BEARING RING BORE

Walter P. Waskiewicz, Bristol, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed May 1, 1995, Ser. No. 432,447
Int. Cl.[6] F16C *43/00*
U.S. Cl. 384—539 22 Claims



1. An adaptor for use with an inner bearing ring, the inner bearing ring having an axis, a cylindrical bore and first and second end surfaces, the adaptor comprising;

a tubular portion having a cylindrical outer surface adapted to be received within the inner bearing ring cylindrical bore, a non-cylindrical inner surface adapted to receive a non-cylindrical shaft, and providing first and second adaptor ends; and

a plurality of foldable tabs distributed along the circumference of the first and second adaptor ends, the foldable tabs being directed substantially radially outwardly from the cylindrical outer surface of the tubular portion and angled axially inwardly;

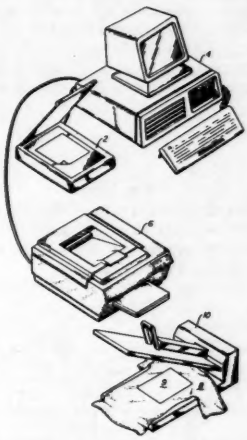
the tubular portion and foldable tabs being formed integrally of a resilient material such that the foldable tabs may transiently fold to permit insertion of the adaptor into the bearing ring cylindrical bore and engage the first and second bearing ring end surfaces to retain the adaptor in the inner bearing ring after insertion.

5,487,614

METHOD OF PRINTING A MULTIPLE COLOR IMAGE USING HEAT SENSITIVE INKS

Nathan S. Hale, Mt. Pleasant, S.C., assignor to Sawgrass Systems, Inc., a South Carolina Corporation, Mt. Pleasant, S.C.

Continuation of Ser. No. 195,851, Feb. 10, 1994, Pat. No. 5,431,501, which is a continuation-in-part of Ser. No. 724,610, Jul. 2, 1991, Pat. No. 5,302,223, which is a continuation-in-part of Ser. No. 549,600, Jul. 9, 1990, abandoned. This application Mar. 8, 1994, Ser. No. 207,756
The portion of the term of this patent subsequent to Sep. 21, 2010, has been disclaimed.
Int. Cl.[6] B41J *2/315*
U.S. Cl. 400—120.02 4 Claims



1. A method of printing a multiple color image using heat sensitive inks printed by a color thermal ink jet printer, comprising the steps of:

a. creating a multiple color image;

b. providing a color thermal ink jet printer;

c. printing, by thermal means and by multiple color process, heat sensitive inks in at least three colors to form said multiple color image on a medium by means of said inks, wherein the printing by thermal means is at a temperature which is below the temperature at which said heat sensitive inks activate, and wherein the thermal means is said color thermal ink jet printer; and

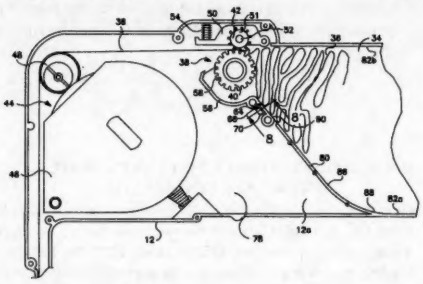
d. transferring said heat sensitive inks from said medium to an object on which the image is to appear by applying heat to said medium at a temperature which is above the temperature at which said heat sensitive inks activate, so as to cause sufficient of said heat sensitive inks to activate and bond to said object to form the multiple color image on said object.

5,487,615

RIBBON DRIVE ASSEMBLY FOR RIBBON CARTRIDGE

Sakae Hayao, Chatsworth, Calif., assignor to Sercomp Corporation, Chatsworth, Calif.

Filed Oct. 28, 1994, Ser. No. 330,446
Int. Cl.[6] B41J *35/28*
U.S. Cl. 400—207 13 Claims



1. A ribbon cartridge for printers, the ribbon cartridge including a housing having a bottom wall portion, a re-inking assembly provided within the housing for re-inking a ribbon, and a ribbon drive assembly provided within the housing for advancing the ribbon, the improvement comprising:

a first engaging device affixed to the bottom wall portion of the housing; and

a second engaging device provided on the ribbon drive assembly for removably engaging the first engaging device; and

wherein the ribbon drive assembly includes a bracket and a drive gear rotatably mounted on the bracket, the bracket including a step-like protrusion and the first engaging device having a first hook for engaging with the step-like protrusion of the bracket.

5,487,616

METHOD FOR DESIGNING AN ERGONOMIC ONE-FINGER KEYBOARD AND APPARATUS THEREFOR

Jean D. Ichbiah, 58 Lexington St., Essex, Mass. 01803, assignor to Jean D. Ichbiah, Burlington, Mass.

Filed Jun. 1, 1995, Ser. No. 457,042
Int. Cl.[6] B41J *5/10*
U.S. Cl. 400—489 12 Claims

esc	Z	V	C	H	W	K	-	<>	/	*	+
del	F	I	T	A	L	Y	,	<<<	7	8	9
tab			N	E			.	back	4	5	6
shift	G	D	O	R	S	B	(	enter	1	2	3
cap	Q	J	U	M	P	X	)	alt	=	0	%
ctrl	!	?	:	;	'	"	&	<	>	@	#	$

1. A method for designing a keyboard layout and assigning a plurality of characters in a target language to a keyboard for efficient entry of data using a single data entry vehicle, said keyboard comprising a plurality of keys including at least one key for each of said plurality of characters in said target language wherein the keys are arranged and disposed in a simple geometric formation, said formation defining a distance between every pair of said keys and said keys further arranged in accordance with the method comprising the steps:

(a) calculating a frequency of use for each of said plurality of characters from a representative corpus of text for said target language;

(b) calculating a frequency of transitions between each pair of characters in said plurality of characters from said representative corpus of text for said target language;

(c) defining a geometry for the keys of the keyboard and calculating the corresponding distance between every pair of keys in said keyboard;

(d) defining a current assignment for the plurality of characters to at least one of the keys on the keyboard and computing an average distance of travel for the single data entry vehicle by weighing the corresponding distance between every pair of said keys assignment by the frequency of transition between the corresponding characters for the assigned keys according to the current assignment;

(e) defining an alternative assignment obtained by permutation of the plurality of characters on said keys and replacing the current assignment by the alternative assignment if the average distance of travel for the alternative assignment is less than that for the current assignment;

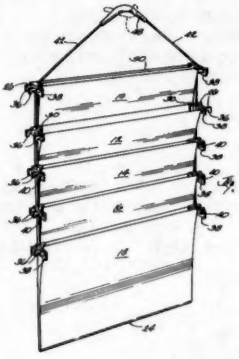
(f) repeating step (e) for all permutations of the plurality of characters.

5,487,617

HANGING FILE SYSTEM AND APPARATUS

Josephine A. Cole, 2034 N. 49th St., Milwaukee, Wis. 53208, and Kenneth J. Muderlak, 4481 N. Maryland Ave., Shorewood, Wis. 53211

Filed Feb. 22, 1994, Ser. No. 199,549
Int. Cl.[6] B42D *15/00;* B42F *15/00*
U.S. Cl. 402—4 6 Claims



1. The combination with pendant files of the type having heavy paper stock folders having generally rectangular front and back panels each of which has upper and lower edges hinged to one another at said lower edges, each of said panels also having upper front and rear corners, said front and back panels being provided with downwardly opening front and rear hook means respectively which are to be placed over supports in a file storage facility, means enabling a plurality of said folders to be suspended on a vertical surface in a vertically overlapping manner affording easy viewing of the upper edges of each folder and easy access to an interior of each folder, said enabling means comprising,

support means connected to each of said rear hook means and including means receiving the adjacent front hook means,

means flexibly interconnecting all said support means on each side of a group of file folders and including a central hanging point on the portion of said interconnecting means which extends between said upper corners of the file which is uppermost when the files are hung on a vertical surface,

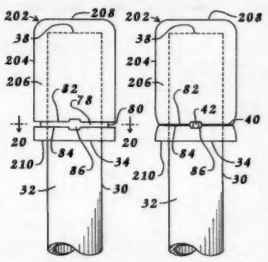
and stop means mounted on said interconnecting means to limit downward movement of each said support means to provide for vertical spacing between the files.

5,487,618

BARRIER DEVICE FOR A TRAFFIC BOLLARD TO PROTECT DETACHED MOVABLE OBJECTS DURING CONTACT

Charles E. Cox, 1016 Superior St. Lot 6, Fort Myers, Fla. 33916

Filed Jul. 25, 1994, Ser. No. 280,078
Int. Cl.[6] E01F *15/00*
U.S. Cl. 404—6 3 Claims



1. An impact protection sleeve to be secured to a bollard, the bollard of the type protecting stationary objects from vehicular contact, the bollard having a terminal end, a circular cross section, a periphery, a determinable location of attachment, the terminal end being an end accessible above ground level, the determinable location of attachment being the desired position for installation of the protective attachment device, the bollard having a circumference measured at the determinable location of attachment, the protective attachment device to provide impact absorbing properties to protect secondary, movable objects from damage during contact with the bollard, the impact protection device comprising:

a) a body, the body formed substantially of a compressible, impact absorbent material, the body having a resilient shape, an interior surface, an exterior surface, a trench, a top end, a bottom end, the resilient shape being cylindrical, the interior surface having a circumference, the interior surface to be in contact with the periphery of the bollard following attachment, the exterior surface providing impact absorbing protection for the movable objects being protected form contact with the bollard following attachment, the trench formed in the exterior of the body and axially extending circumferentially around the body relatively parallel to the bottom end of the body, the trench having an upper outer edge, a lower outer edge and a base, the base of the trench offset from the interior surface of the body, the bottom end open of the body to permit installation of the body over the terminal end of the bollard;

b) a draw strap to secure the body to the bollard, the draw strap placed within the trench during installation, the draw strap having a locking member and a flexible tab, the flexible tab extending from the locking member and terminating with a pull end, the locking member having a channel and a pivotal engagement member, the channel having an insertion side and an exit side, the channel forming a passage through the locking member, the pivotal engagement member penetrating the channel, the extending tab having incorporated thereon spaced teeth, the locking member adaptable to receive through the channel form the insertion side a portion of the tab in a unidirectional manner permitting insertion therethrough while providing for engagement of the locking member to engage the teeth of the tab to prohibit removal of the portion of the tab inserted therethrough, the draw strap causing contraction of the trench to bring the upper outer edge of the trench in close proximity to the lower outer edge of the trench following installation;

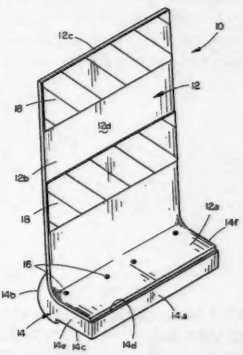
whereby the impact protection device would be secured to the bollard to provide impact absorbing protection to other detached movable objects which may impact the bollard during normal movement of the other objects.

5,487,619

SELF-RIGHTING WARNING MARKER

Terence M. Winebrenner, 11914 "I" St., Omaha, Nebr. 68137

Filed Jan. 24, 1995, Ser. No. 377,477
Int. Cl.[6] E01F *13/00*
U.S. Cl. 404—6 11 Claims



1. A self-righting warning marker, comprising:

a base having a forward surface defining a free end thereof, a rearward surface, opposing left and right ends, and opposing top and bottom surfaces;

said rearward surface adjoining a portion of the bottom surface along an arcuate pivot surface, means providing pivotal movement of the marker from to a substantially horizontal orientation to an upright orientation, the horizontal orientation having the rearward surface in contact with ground and the top and bottom surfaces generally perpendicular thereto;

a warning sign attached to said base and extending upwardly therefrom oriented generally perpendicularly to the base bottom surface;

said warning sign having indicia thereon for visually alerting a person located forwardly of the marker;

said warning marker having a center of gravity located to cause the base to be biased to an upright orientation from the horizontal orientation, pivoting along said pivot surface;

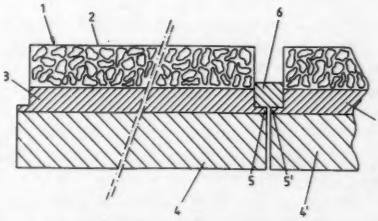
said base bottom surface having a forward edge located to stop pivotal movement of the base from the horizontal position beyond a predetermined upright position.

5,487,620

DRAINING PAVEMENT ELEMENT, METHOD FOR MANUFACTURING IT AND PAVEMENT MADE WITH IT

Harm W. Holman, Doesburg, Netherlands, assignor to Terra IJssel B.V., Lathum, and Harm Willem Holman, Doesburg, both of, Netherlands

Filed Jun. 28, 1994, Ser. No. 266,550
Claims priority, application Netherlands, Jun. 30, 1993, 9301143
Int. Cl.[6] E01C *5/00;9/00*
U.S. Cl. 404—31 22 Claims



1. Pavement element which comprises:

an upper layer consisting of a liquid permeable composition of solid particles and at least one binding agent,

a lower, liquid impervious layer connected to the bottom of said upper layer and having an outer perimeter, and

a lower layer sealing means associated with at least a portion of the outer perimeter of the lower layer for joining the lower layer of adjacent pavement elements together in a liquid tight manner in order to obtain a unitary liquid impervious layer formed from a plurality of adjacent pavement elements.

5,487,621

LARGE-DEPTH UNDERGROUND DRAINAGE FACILITY AND METHOD OF RUNNING SAME

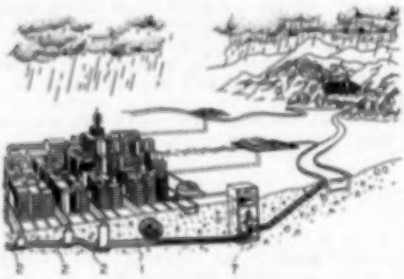
Kunio Takada, Ibaraki; Kenji Otani; Masayuki Yamada, both of Tsuchiura; Saburo Maru, Ibaraki; Sumio Sudo, Ibaraki, and Sadashi Tanaka, Ibaraki, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 900,418, Jun. 18, 1992, Pat. No. 5,360,289, and a continuation-in-part of Ser. No. 988,755, Dec. 10, 1992, Pat. No. 5,360,290. This application Feb. 4, 1994, Ser. No. 192,289

Claims priority, application Japan, Feb. 5, 1993, 5-018783

Int. Cl.[6] **E02F** *1/00;* **E02B** *11/00*

U.S. Cl. 405—52 **6 Claims**



1. In a large-depth underground drainage facility including an underground water channel of a large capacity which is provided in an underground location at a large depth and which is slanting gently, a plurality of vertical shafts for leading drain water downwardly into said underground channel from flood control channels provided in an near to a ground surface; a pump well provided at a downstream end of said underground channel; and a pump station having a pump for pumping water which has flowed into said pump well to rivers or the sea;

the improvement wherein said pump in said pump station includes an impeller disposed generally at a medium water level of said underground channel; wherein said pump is capable of pumping the water from a closed channel water level at a rated flow rate and also of pumping the water from an open channel water level at a minimum flow rate; and wherein said pump achieves maximum efficiency at a flow rate between the rated flow rate and the minimum flow rate.

5,487,622

SYSTEM FOR TREATING POLLUTED GROUNDWATER

John A. Cherry; Enoch S. Vales, both of Waterloo, and Robert W. Gillham, Guelph, all of, Canada, assignors to University of Waterloo, Waterloo, Canada

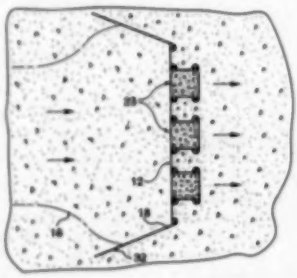
PCT No. PCT/GB93/00860, § 371 Date Oct. 20, 1994, § 102(e) Date Oct. 20, 1994, PCT Pub. No. WO93/22241, PCT Pub. Date Nov. 11, 1993

PCT Filed Apr. 23, 1993, Ser. No. 331,535

Claims priority, application United Kingdom, Apr. 23, 1992, 9208822

Int. Cl.[6] **C02F** *1/00;* **E02D** *19/18;5/06*

U.S. Cl. 405—128 **22 Claims**



1. System for in-situ treatment of contaminated groundwater in an aquifer, wherein:

the system is of the kind in which the contaminated groundwater moves through the aquifer due to in-ground pressure-head gradients;

the system includes a barrier or wall that extends down into the ground, the wall being placed in the path of the in-ground movement of the contaminated groundwater, the wall dividing an upstream portion of the aquifer from a downstream portion of the aquifer;

the wall is watertight, in the sense of being effective to substantially prevent the passage of groundwater through the wall;

the system includes at least one gap or gate in the wall;

the system includes a body of treatment material;

the body of treatment material is porous and permeable to the extent that groundwater can pass through the treatment material;

the treatment material is of such a chemical composition, in relation to the nature of the contaminant, that the contaminant in the water undergoes a chemical change, upon the water being passed through the treatment material;

the body is located in the ground, in the gate, and is so arranged that groundwater can pass from the upstream portion of the aquifer to the downstream portion of the aquifer through the treatment material;

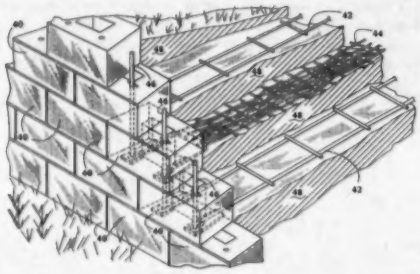
the system includes a gate sealing means which is effective to prevent the passage of groundwater between the wall and the body of treatment material in the gate, whereby groundwater cannot pass from the upstream portion of the aquifer to the downstream portion of the aquifer except through the treatment material;

the arrangement and dimensions of the gate, the body of treatment material, and the sealing means are such, in relation to the velocity of flow of the groundwater, that even the shortest path through the treatment material from the upstream portion of the aquifer to the downstream portion of the aquifer is long enough to ensure a residence period of the contaminated water within the body of treatment material of sufficient time as to ensure the effective treatment of the contaminant.

5,487,623
MODULAR BLOCK RETAINING WALL CONSTRUCTION AND COMPONENTS

Peter L. Anderson, Centreville; Michael J. Cowell, Leesburg, and Dan J. Hotek, Chantilly, all of Va., assignors to Societe Civile des Brevets Henri C. Vidal, France

Continuation-in-part of Ser. No. 40,904, Mar. 31, 1993. This application Aug. 18, 1993, Ser. No. 108,933
Int. Cl.[6] E02D *29/02*
U.S. Cl. 405—286 **35 Claims**



1. An improved wall construction comprising, in combination:

a plurality of facing block members arrayed in overlapping courses one upon the other, each block member having a generally planar front face, a back face, sides connecting the front face to the back face, and generally parallel top and bottom surfaces;

each block member also including at least two generally parallel, spaced counterbores in one of the parallel top and bottom surfaces extending from adjacent the front face through the back face, and a cross-counterbore connecting the parallel counter bores;

each block member further including a throughbore extending adjacent the front face of the block member from each one of the counterbores through the top or bottom surface, each counterbore surrounding a throughbore, said throughbores being parallel;

a stabilizing element comprising a tension arm in each of the counterbores of selected block members to define pairs of tension arms, each said pair of said tension arms of each stabilizing element being generally parallel and connected together by a cross member positioned in the cross-counterbore;

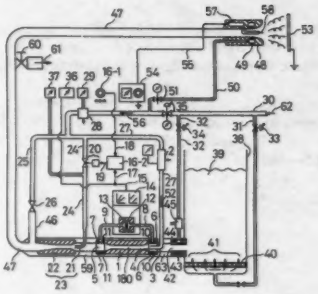
the stabilizing elements including soil engaging means projecting away from the back face of each block member into compacted soil; and

compacted soil for receipt of the soil engaging means for engagement with the soil.

5,487,624
POWDER FEEDING APPARATUS, ELECTROSTATIC POWDER COATING APPARATUS AND POWDER FLOW-RATE MEASURING APPARATUS

Hiromichi Toyota, and Masao Iwanaga, both of Tokyo, Japan, assignors to I.T.M. Corporation, Tokyo, Japan

Filed Feb. 18, 1994, Ser. No. 198,764
Int. Cl.[6] B65G *51/16*
U.S. Cl. 406—14 **52 Claims**



1. A powder feeding apparatus in which powder is fed through a large-diameter powder/feeding duct by a carrier gas supply means, said powder feeding apparatus comprising:

a means for adjusting a portion of a carrier gas to a fixed flow rate and supplying said portion as a powder flow rate detection gas;

a sensor nozzle which is provided on the downstream side of said means and through which said powder flow rate detection gas flows out;

a powder flow rate measuring capillary which is provided on the downstream side of and in close proximity to said sensor nozzle, which has an inlet and an outlet, and which has a diameter that is smaller than that of said large-diameter powder feeding duct;

pressure difference measuring means which are connected to said inlet and said outlet through filter means for the purpose of measuring a pressure difference between the inlet and the outlet of said capillary and which constitute a blind pipe route having an invariant interior volumes during normal operation;

a means for introducing powder to the inlet of said powder flow rate measuring capillary;

a large-diameter powder feeding duct connected to the downstream side of said capillary; and

a means for adjusting the pressure difference between the inlet and the outlet of said powder flow rate measuring capillary.

5,487,625
OXIDE COATED CUTTING TOOL

Bjorn Ljungberg, Enskede, and Anders Lenander, Tyreso, both of, Sweden, assignors to Sandvik AB, Sandviken, Sweden

Filed Nov. 30, 1993, Ser. No. 159,217
Claims priority, application Sweden, Dec. 18, 1992, 9203852
Int. Cl.[6] B23P *15/28;* **B32B** *9/04*
U.S. Cl. 407—119 **7 Claims**

1. A coated cutting tool body with one or more refractory layers of which at least one layer is alumina, said alumina layer having a thickness (d) of 0.5–25 μm and a single phase α-structure with a grain size (s):

.5 μm<s<1 μm for .5 μm<d<.5 μm; and

.5 μm<s<3 μm for .5 μm<d<25 μm,

said alumina layer exhibiting a texture coefficient greater than 1.3 for the (012) growth direction of the equivalent crystallographic planes defined as:

$$TC(hkl) = \frac{I(hkl)}{I_o(hkl)} \left\{ \frac{1}{n} \Sigma \frac{I(hkl)}{I_o(hkl)} \right\}^{-1}$$

wherein:

I(hkl)=measured intensity of the (hkl) reflection;

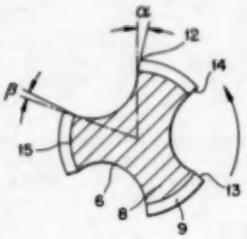
I_o(hkl)=standard intensity of the ASTM standard powder pattern diffraction data; and

n=number of reflections used in the calculation, wherein (hkl) reflections used are: (012), (104), (110), (113), (024), (116).

5,487,626
THREADING TAP

Peder Von Holst, Sandviken, Sweden, and Josef Giessler, Mühlenbach, Germany, assignors to Sandvik AB, Sandviken, Sweden

Filed Sep. 7, 1994, Ser. No. 301,608
Claims priority, application Sweden, Sep. 7, 1993, 9302885
Int. Cl.[5] B23G 5/06
U.S. Cl. 408—144 6 Claims

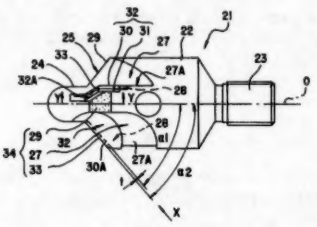


1. A threading tap comprising an elongate, substantially cylindrical shaft, which at one is provided with two or more lands which are straight or helically twisted around the central axis of the shaft, which lands are provided with cutting threads of substantially equal profiles and which are separated by straight or equally twisted chip-conveying flutes, at least the portion of the threading tap provided with lands comprising a core of high speed steel or tool steel and a cover of a hard material of 30 to 70% by volume of submicronic hard materials of carbides, nitrides and/or carbonitrides of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo and/or W in a metallic matrix based on Fe, Co and/or Ni, the chip surfaces adjacent to the cutting edges of the cutting threads having a negative rake angle between −6° and −12°.

5,487,627
COUNTER SINK DRILL

Hiroshi Kasutani; Takao Koyama, both of Gifu; Kouji Hashimoto, and Yutaka Adachi, both of Aichi, all of, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Jul. 26, 1994, Ser. No. 280,767
Int. Cl.[6] B23B 51/10
U.S. Cl. 408—145 3 Claims



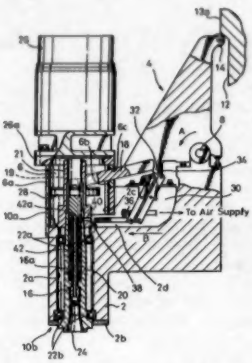
1. A counter sink drill including a pilot portion disposed at a distal end of a cutter body rotatable about its axis, said distal end projecting along said axis, and a countersinking section adjacent said pilot portion on a base end of said cutter body,

said countersinking section comprising a roughing section formed of an abrasive layer on a conical surface on said cutter body, a chip discharge groove recessed from said roughing section radially inwardly with respect to said axis, and a finishing edge having a path of rotation about said axis and aligned with said roughing section along said axis, at least one of said roughing section, said chip discharge groove and said finishing edge being disposed in the circumferential direction of said cutter body.

5,487,628
DEVICE FOR PREVENTING CUTTING FLUID FROM ENTERING A BEARING ON A SPINDLE IN A MACHINE TOOL

Ryuji Suzuki, Yamanashi, Japan, assignor to Fanuc Ltd., Yamanashi, Japan

Filed Dec. 15, 1994, Ser. No. 356,549
Claims priority, application Japan, Dec. 16, 1993, 5-316892
Int. Cl.[6] B23Q 11/00
U.S. Cl. 409—135 11 Claims



1. A device for preventing cutting fluid from entering a bearing rotatably supporting a spindle in a machine tool, comprising

means for forming a pressure chamber enclosing a region adjacent to said bearing; and

means for supplying air to said pressure chamber to increase the pressure within said pressure chamber.

5,487,629
COOLING AND DUST COLLECTING APPARATUS FOR MACHINE TOOL

Fumio Watanabe, Utsunomiya, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1994, Ser. No. 321,856
Claims priority, application Japan, Dec. 1, 1993, 5-301765
Int. Cl.[6] B23C 9/00; B23Q 11/00
U.S. Cl. 409—137 20 Claims

1. A cooling and dust collecting apparatus for a machine tool for cooling a cutter and for sucking and discharging cutting chips to the outside of said apparatus, said apparatus comprising:

a housing fixed to said machine tool for enclosing a spindle and a cutter of said machine tool;

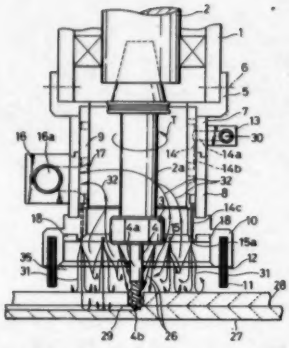
an elastic hood suspended from the bottom end of said housing for ensuring an enclosure of said housing;

cold air supplying means for supplying pressurized cold air;

a first cold air intake attachment mounted on said housing for introducing said pressurized cold air from said cold air supplying means into said housing;

a second cold air intake attachment mounted on said housing for introducing said pressurized cold air from said cold air supplying means into said housing;

a plurality of first cold air outlet holes provided at equal spaces on a bottom surface of said housing so as to form an air curtain around said cutter with said pressurized cold air blown vertically from said first cold air outlet holes;



a plurality of second cold air outlet holes provided in a ring attachment detachably connected to the bottom of said housing so as to cool said cutter with said pressurized cold air blown diagonally and downwardly from said second cold air outlet holes;

first cold air passage means provided in said housing for communicating said first cold air intake attachment and said first cold air outlet holes;

second cold air passage means provided in said housing for communicating said second cold air intake attachment and said ring attachment;

a cold air discharging attachment mounted on said housing for discharging cutting chips from inside of said housing together with said pressurized cold air; and

cutting chip sucking means communicated to said cold air discharging attachment for sucking and collecting cutting chips.

5,487,630

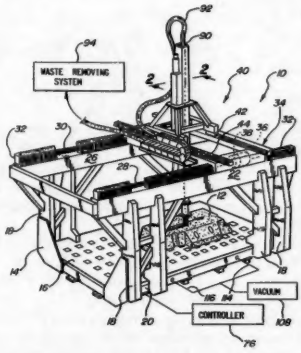
MACHINE FOR CUTTING A WORKPIECE MADE OF STYROFOAM OR LIKE MATERIAL

Jonathon Campian, 1900 E. 14 Mile Rd., Madison Heights, Mich. 48071

Division of Ser. No. 208,616, Mar. 9, 1994, Pat. No. 5,429,460. This application Feb. 9, 1995, Ser. No. 386,276

Int. Cl.[6] B23C *9/00*

U.S. Cl. 409—225 **7 Claims**



1. A machine for cutting a workpiece made of styrofoam or like material comprising said frame,

a frame having a generally planar base adapted to support the workpiece,

a rotary cutter,

means the rotatably driving said rotary cutter,

means the movably mounting said cutter to said frame above said base,

wherein said cutter removes material from the workpiece upon contact with the workpiece,

means for evacuating material removed from the workpiece through openings formed in said cutter,

means for attaching the workpiece to said base, said attaching means comprising at least one fluid port formed through said base,

a vacuum source,

means the fluidly connecting said vacuum source to said port,

a plurality of fluid ports formed through said base and fluidly connected to said vacuum source, said ports being spaced apart from each other, and

valve means associated with each port, said valve means be operable between an open and a closed position,

wherein said base comprises a recess surrounding each fluid port and wherein valve means comprises a flap positioned in said recess, said flap having an opening formed through it, said flap being movable between a first position in which said flap opening registers with said port and a second position in which said flap overlies and covers said port.

5,487,631

MACHINE TOOLS

Robin E. Child, Leamington Spa, Great Britain, assignor to Systematic Drill Head Co. Ltd., Warwickshire, United Kingdom

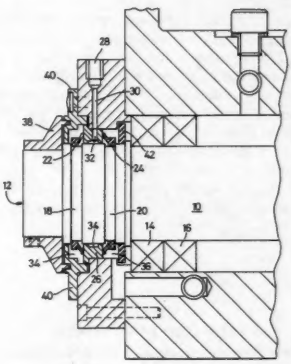
PCT No. PCT/GB93/01791, § 371 Date May 18, 1994, § 102(e) Date May 18, 1994, PCT Pub. No. WO94/07061, PCT Pub. Date Mar. 31, 1994

PCT Filed Aug. 23, 1993, Ser. No. 244,178

Claims priority, application United Kingdom, Sep. 19, 1992, 9219873

Int. Cl.[6] B23Q *11/12*

U.S. Cl. 409—231 **13 Claims**



1. A machine tool spindle assembly comprising a rotatable spindle; a pair of resilient wiping seals; a fixed, non-rotatable component encircling said spindle, said seals being mounted on said spindle for rotation therewith and making sealing engagement with opposite faces of said component when said spindle is at rest; and means for applying pressure fluid to said wiping seals so as to effect displacement of said seals from engagement with said component.

5,487,632

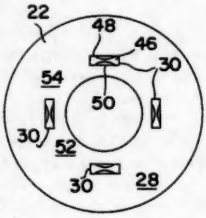
DIRECT TENSION INDICATOR WASHER

A. Craig Hood, Wayne, Pa., and Lloyd J. Larson, Buffalo, Minn., assignors to J & M Turner, Inc., Southampton, Pa.

Continuation-in-part of Ser. No. 81,636, Jun. 24, 1993, Pat. No. 5,370,483. This application Jun. 20, 1994, Ser. No. 262,787

Int. Cl.[6] F16B *31/02*

U.S. Cl. 411—10 4 Claims



1. A pre-load indicating washer comprising an annular body and a plurality of pairs of:

(a) protuberances integral with said annular body struck and partially sheared from said annular body to project from a first face of said annular body, and

(b) indentations left in a second face of said annular body opposite from said first face upon formation of said protuberances,

each of said protuberances defined by:

(a) a pair of outer side walls extending away from said first face of said annular body, and

(b) an outer surface extending between said pair of outer side walls and between two spaced regions of said first face of said annular body, and

each of said indentations defined by:

(a) a pair of inner side walls extending through said annular body from said second face of said annular body and from which a pair of outer side walls of one of said protuberances has been sheared, and

(b) an inner surface extending between said pair of inner side walls and between two spaced regions of said second face of said annular body,

each pair of said protuberances and indentations formed with a mass concentration along a central region between said outer side walls of said protuberance and said inner side walls of said indentation and extending along a selected length between said two spaced regions of said first face of said annular body and said two spaced regions of said second face of said annular body with:

(a) the regions at which said inner side walls of said indentations meet said inner surfaces of said indentations having a radius of curvature of at least 1/32", and

(b) both said outer surface of said protuberance and said inner surface of said indentation curved with a radius of curvature of at least 0.288".

5,487,633

SELF-DRILLING SCREW

David J. Roberts, Mornington, Australia, assignor to W. A. Deutscher Pty. Ltd., Moorabbin, Australia

Filed Jun. 9, 1994, Ser. No. 257,308

Claims priority, application Australia, Jun. 9, 1993, PL9263

Int. Cl.[6] F16B *23/00;25/00*

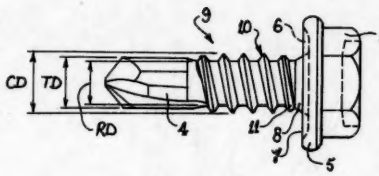
U.S. Cl. 411—387 20 Claims

1. A self-drilling screw for use with both relatively thick metal plate and relatively thin metal sheet, comprising:

an elongate shank;

an enlarged head formed upon one end of said elongate shank;

a drilling tip formed upon an opposite end of said elongate shank and having a predetermined diametrical extent;



an enlarged shank section located adjacent to said head, wherein the cross-sectional size of said enlarged shank section progressively increases in a direction away from said drilling tip and toward said enlarged head; and

a thread having a first portion formed upon a portion of said elongate shank which extends between said enlarged shank section and said drilling tip, and having a crest diameter dimension which is greater than said diametrical extent of said drilling tip and a root diameter dimension which is less than said diametrical extent of said drilling tip such that said first portion of said thread is able to threadedly engage a relatively thick metal plate when said self-drilling screw is inserted through said relatively thick metal plate; and a second portion which also extends onto said enlarged shank section such that said enlarged shank section and said second portion of said thread are able to distort a relatively thin metal sheet into wedging interengagement with said second portion of said thread and said enlarged shank section when said self-drilling screw is inserted through said relatively thin metal sheet.

5,487,634

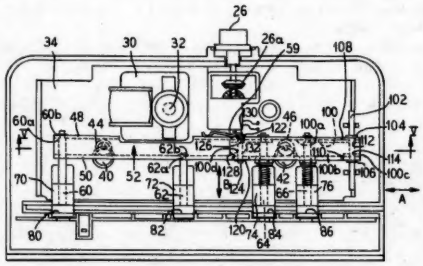
PUNCH SELECTABLE PUNCH PRESS

Al Vercillo, Harwood Heights, Ill., assignor to General Binding Corporation, Northbrook, Ill.

Filed Jun. 27, 1994, Ser. No. 266,231

Int. Cl.[6] B42B *9/00*

U.S. Cl. 412—16 14 Claims



1. In a punch press having a plurality of punches arranged to punch holes through sheets, the improvement comprising:

a pressure bar reciprocatable toward and away from sheets to be punched;

a first punch and a second punch arranged spaced along said pressure bar and movably inserted through respective holes in the pressure bar, the first and second punch having first and second groove formations respectively;

a selector rail mounted reciprocally with respect to said pressure bar and having notches alignable with and facing said first and second groove formations of said punches, reciprocation of said selector rail in a first direction engaging a first notch to said first groove formation and disengaging said second notch from said second groove formation, and reciprocating said selector rail in an opposite direction disengaging said first notch from said first groove formation and engaging said second notch to said second groove formation;

said selector rail movable with said pressure bar toward said paper to instigate punching of said sheets; and

a respective one of said first and second punches, once disengaged from said selector rail is disengaged from said pressure bar.

5,487,635

SLIDE-IN STORE FOR ROLLER PALLETS AND A PROCESS FOR INSERTING GOODS INTO AND WITHDRAWING GOODS OUT OF SAID STORE

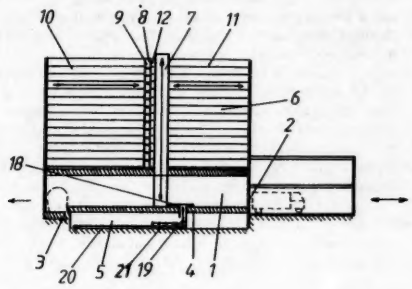
Ludger Hellkuhl; Siegfried Mörs; Günter Pelzer, and Friedhelm Wesselmann, all of Gütersloh, Germany, assignors to Miele & Cie. GmbH & Co., Guetersloh, Germany

Continuation-in-part of Ser. No. 752,658, Aug. 21, 1991, abandoned. This application Mar. 21, 1994, Ser. No. 216,087

Claims priority, application Germany, Mar. 7, 1989, 39 07 264.9

Int. Cl.[6] B65G *1/04*

U.S. Cl. 414—277 **11 Claims**



1. A slide-in warehouse for roller pallets comprising:

at least three superimposed and horizontally positioned storage levels;

each storage level having a loading channel and being connected to at least one transport passage,

horizontally movable transport vehicles for moving at a right angle with each loading channel, one of said transport vehicles being positioned at each storage level, which transport vehicles comprise means for the horizontal insertion and withdrawal of the roller pallets in the loading channels;

said horizontally movable transport vehicles respectively positioning the roller pallets at the beginning of each loading channel and each transport vehicle having means for coupling a roller pallet to the transport vehicle;

a vertically movable transport vehicle for moving said roller pallets between said at least three storage levels;

wherein said at least three storage levels are located one on top of the other and further comprising:

a first storage level being an operational level for the insertion and withdrawal of goods;

a second storage level for the storage and consignment of the goods; and

a third storage level comprising an auxiliary operational level for the storage, preparation and supplying of the roller pallets into the operational level.

5,487,636

TIME AND COST EFFICIENT STORAGE FACILITY

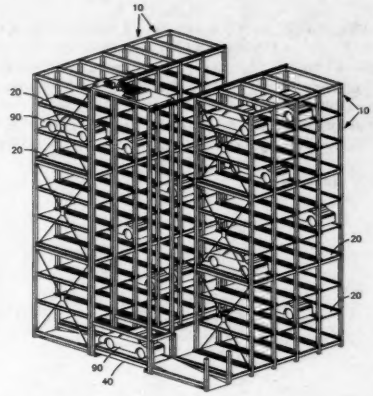
Mais Mkrtchyan, 614 Salem St., #2, Glendale, Calif. 91203

Filed Apr. 12, 1995, Ser. No. 421,431

Int. Cl.[6] B65G *1/04*

U.S. Cl. 414—286 **5 Claims**

1. A multilevel storage facility comprising:



a plurality of vertically stacked storage chambers and a plurality of storage platforms, each of the chambers containing one of the platforms, all of the chambers being accessible from a common face of the facility;

an elevator, mounted to move along the common face of the facility for providing access to any one of the chambers;

each of the chambers and the elevator providing a lower storage means for engaging one of the platforms when said platform is empty, and an upper storage means for engaging one of the platforms, when said platform contains an item for storage thereon, each of the platforms including a plurality of wheels positioned for engaging the upper storage means, and alternately, the lower storage means, such that with the elevator aligned with any one of the chambers, the respective elevator and chamber lower storage means and upper storage means are respectively aligned so that platform transfers are enabled therebetween;

the elevator further including a first transferring means for transferring one of the platforms between one of the chambers and the elevator, and a second transferring means for transferring one of the platforms between the elevator lower storage means and the elevator upper storage means; the second transferring means including a plurality of U-shaped sections, each providing an upper, and a lower rest surface for supporting one of the wheels of one of the platforms, the U-shaped sections including means for vertical positioning thereof, such that with the wheels of one of the platforms positioned on the lower rest surfaces of the U-shaped sections respectively, the platform is vertically positionable within the upper, or alternately, the lower storage means of the elevator by vertical adjustment of the position of the U-shaped sections in synchronized motion, and with the lower rest surfaces positioned in the elevator lower storage means, the upper rest surfaces are positioned in the elevator upper storage means, the exchange of platform positions being enabled during elevator movement;

such that an item to be stored in the facility is loaded onto one of the platforms positioned on the elevator upper storage means, and then moved to any empty chamber, swapping the loaded platform in the elevator with the empty platform in the chamber, the loaded platform being transferred into the chamber upper storage means, the empty chamber platform being transferred into the elevator lower storage means, the empty platform then being transferred to the elevator upper storage means in anticipation of repeating a storing sequence; and

to retrieve an item from the facility, first an empty one of the platforms in the elevator upper storage means is transferred to the elevator lower storage means, the elevator is positioned adjacent to a target one of the chambers, and the loaded chamber platform on the chamber upper storage means is transferred to the elevator upper storage means, while the empty elevator platform on the elevator lower storage means is placed into the chamber lower storage means.

5,487,637

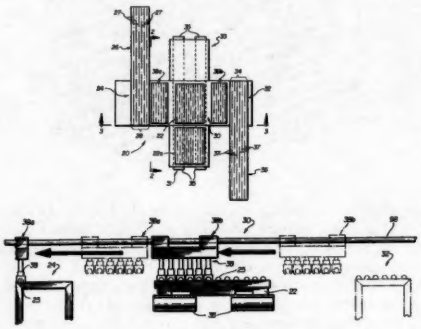
AUTOMATIC TRAY LOADING, UNLOADING AND COMPENSATING SYSTEM

Andrew E. Mojden, Hinsdale, and Richard P. Hoinacki, Oak Lawn, both of Ill., assignors to Fleetwood Systems, Inc., Romeoville, Ill.

Continuation of Ser. No. 984,181, Nov. 20, 1992, Pat. No. 5,372,473. This application Oct. 5, 1994, Ser. No. 318,351

Int. Cl.[6] B65G *57/00*

U.S. Cl. 414—788.4 **12 Claims**



1. An article handling system for compensating for differences between a rate of supply of articles at a first location and a rate of demand for articles at a second location, said system comprising: an infeed station for receiving a plurality of articles from said first location; a working station for accommodating an article-holding tray for storage of a plurality of articles; an outfeed station for receiving articles from said tray at said working station for delivery to a second location; at least two pick-and-place devices, each adapted to engage and thereafter discharge articles, and comprising at least one infeed pick-and-place device and at least one outfeed pick-and-place device; said working station being located between said infeed station and said outfeed station, with a path of movement of said pick-and-place devices overlying said single working station; operating means operating said at least one infeed pick-and-place device for movement between said infeed station and an overlying position with regard to said tray located at said working station for removing articles from said infeed station and discharging articles removed from said infeed station into said tray located at said working station, and for operating said at least one outfeed pick-and-place device for movement between an overlying position with respect to the same tray serviced by the infeed pick-and-place device and said outfeed station for removing articles from said tray located at said working station and for delivering articles removed from said tray to said outfeed station; and control means for controlling the operating means and said pick-and-place devices to remove stacks of articles from said infeed station, to discharge stacks of articles into tray means located at said working station, to remove stacks of articles from tray means at said working station, and to deliver stacks of articles to said outfeed station, respectively.

5,487,638

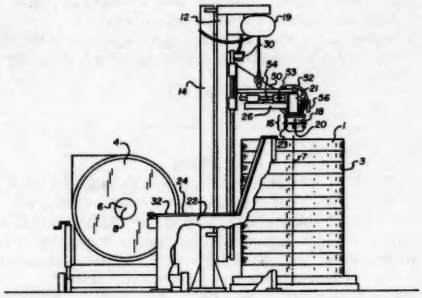
APPARATUS AND METHOD FOR LOADING ROLLS OF WEB INTO A CHAMBER

Fredric S. Salsburg, Victor, and Matthew D. Fairbrother, Caledonia, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 20, 1993, Ser. No. 139,377

Int. Cl.[6] B65G *59/02*

U.S. Cl. 414—796.9 **5 Claims**



1. Apparatus for loading an object from a stack having a first axis into a container having a chamber with a second axis transverse to the first axis, the object including a central opening with an interior wall, said apparatus comprising:

a fixed frame member having a reference axis;

a support member pivotably mounted to said frame member for rotation about said reference axis between a first position at which an object is raised from the stack along said first axis and a second position at which an object is inserted into the chamber along said second axis, and wherein said support member is connected to a follower member;

means for guiding said support member between said first and second positions, said means for guiding comprising a guide track engageable by said follower member, said guide track defining a first elevational position along said first axis and a second elevational position along said second axis;

engaging means rotatably mounted to said support member for firmly engaging the object along said first axis and delivering the object along said second axis into the chamber; and

means mounted to said support member for raising and lowering said engaging means along said support member between said first and second positions.

5,487,639

VORTEX FLOW BLOWER AND VANE WHEEL THEREFOR

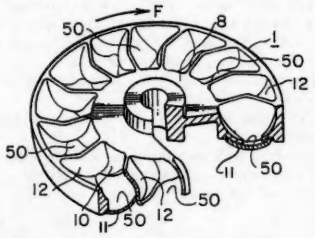
Hiroshi Asabuki; Masayuki Fujio, both of Sakura; Takashi Watanabe, Narita; Susumu Yamazaki, Tsuchiura, and Fumiaki Ishida, Narashino, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 22, 1994, Ser. No. 200,109

Claims priority, application Japan, Feb. 23, 1993, 5-033516; Mar. 17, 1993, 5-056718

Int. Cl.[6] F01D *1/12*

U.S. Cl. 415—55.1 **11 Claims**



1. A vortex flow blower for transferring gas, comprising a motor having an output rotational shaft, and a vane wheel driven by the shaft, wherein the vane wheel comprises:

vortex flow chambers opening in a direction substantially parallel to the output rotational shaft to receive the gas therein, to urge the gas in a substantially circumferential direction of the vane wheel, and to generate and accelerate a vortex flow of the gas therein,

a vane member including a hub through which the vane member is connected to the output rotational shaft, a plurality of vanes each extending monolithically from the hub in a substantially radial direction of the vane wheel, said vanes each including a front surface for urging the gas in the substantially circumferential direction of the vane wheel, and a vortex flow chamber wall extending monolithically from both the hub and each of the vanes, and

a cover means contacting the vortex flow chamber wall to form the vortex flow chambers together with the vortex flow chamber wall and the vanes, and

wherein the vortex flow chamber wall curves to project in a substantially radial direction of the vane wheel.

5,487,640

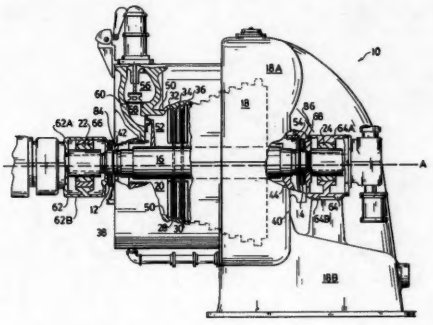
BALANCING RINGS FOR ASSEMBLED STEAM TURBINES

Carl F. Shaffer, Naperville, Ill., assignor to Dresser-Rand Company, Corning, N.Y.

Continuation-in-part of Ser. No. 214,762, Mar. 16, 1994, abandoned. This application Jun. 13, 1994, Ser. No. 258,405

Int. Cl.[6] F01D *25/00*

U.S. Cl. 415—119 **19 Claims**



1. A rotary machine comprising:

a shaft rotatable about an axis;

a housing defining a machine interior and having a first end wall through which said shaft extends;

first and second bearings for rotatably supporting said shaft, wherein said first and second bearings are axially spaced and at least said first bearing is positioned outside the machine interior and proximate said first end wall of said housing; and

at least one balancing ring having a plurality of holes, said balancing ring being coaxially-mounted on said shaft outside the machine interior between said end wall of said housing and said first bearing.

5,487,641

Patent Not Issued For This Number

5,487,642

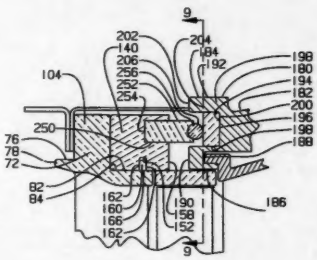
TURBINE NOZZLE POSITIONING SYSTEM

Paul F. Norton, San Diego, Calif., and James E. Shaffer, Maitland, Fla., assignors to Solar Turbines Incorporated, San Diego, Calif.

Continuation-in-part of Ser. No. 215,439, Mar. 18, 1994, Pat. No. 5,380,154. This application Aug. 12, 1994, Ser. No. 262,179

Int. Cl.[6] F04D *29/60*

U.S. Cl. 415—209.2 **6 Claims**



1. A system for positioning a nozzle guide vane assembly within a gas turbine engine having a central axis, a combustor and a turbine assembly positioned therein, said system positioning the nozzle guide vane assembly in radially spaced relationship to the central axis and the turbine assembly and in axially spaced relationship to the combustor, said system for positioning comprising:

an outer shroud defining an outer surface and having a mounting leg extending radially outwardly therefrom, said mounting leg having an opening therein, said outer shroud being positioned adjacent the combustor;

a tip shoe ring defining an inner surface being radially positioned about the turbine assembly and an outer surface having a mounting member extending radially inwardly therefrom, said mounting member having an opening therein being axially aligned with the corresponding opening in the mounting leg;

a nozzle support ring being positioned in contacting relationship to the tip shoe ring and having plurality of holes therein;

a support structure and a spherical bearing being interposed the nozzle support ring and a support structure being attached to the gas turbine engine;

a plurality of pins being positioned in the opening in the mounting leg, the opening in the mounting member and in at least a portion of each of the plurality of holes in the nozzle support ring, said plurality of pins positioning the outer shroud, the tip shoe ring and the nozzle support ring in a ring shaped structure and;

means for retaining the plurality of pins from axial movement.

5,487,643

PARTIAL ADMISSION AXIAL IMPULSE TURBINE INCLUDING COVER FOR TURBINE WHEEL ROTATING ASSEMBLY

Lowell W. Pearson, Hermosa Beach, Calif., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Jan. 18, 1994, Ser. No. 181,326

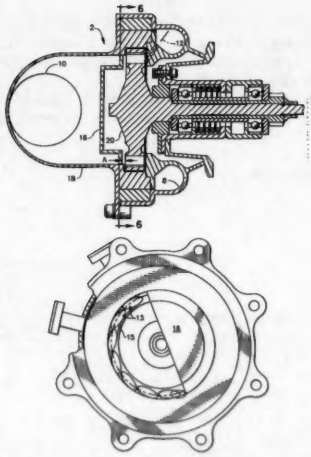
Int. Cl.[6] F01D *9/00*

U.S. Cl. 415—211.2 **14 Claims**

1. An axial impulse partial admission turbine, comprising:

a plurality of nozzles configured in an array forming a partial arc, each of said nozzles comprising an opening for allowing gas to flow therethrough;

a rotating turbine wheel having an inlet face opposite said are shaped nozzle array and an exit face on the side opposite the inlet face;



a turbine wheel housing enclosing a portion of the rotating turbine wheel and providing an exit plenum adjacent the exit face of the turbine wheel; and

a turbine pressure gradient control cover positioned in said exit plenum and affixed to the turbine wheel housing, opposite the turbine wheel exit face covering a portion of the turbine exit face not axially aligned with the arc shaped nozzle array, wherein gas flowing through said nozzle array flows axially through the turbine, and the cover reduces peripheral gas flow past the exit face of the turbine wheel to thereby reduce the turbine pressure gradient loss and increase turbine efficiency.

5,487,644

PUMP HAVING A SINGLE OR A PLURALITY OF HELICAL BLADES

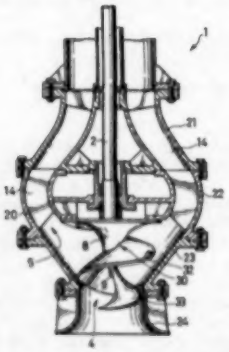
Eiichi Ishigaki; Kazumitsu Oura, and Takaharu Honda, all of Kagawa, Japan, assignors to Ishigaki Mechanical Industry Co., Ltd, Tokyo, Japan

Continuation of Ser. No. 941,446, Dec. 14, 1992, abandoned. This application Oct. 17, 1994, Ser. No. 323,589

Claims priority, application Japan, Feb. 13, 1987, 62-19618; Aug. 31, 1989, 1-102287

Int. Cl.[6] F01D *9/00*

U.S. Cl. 415—220 **3 Claims**



1. A vertical pump wherein a plurality of blades (**10**, **11**, **12**) is fixedly mounted on a forward end of a rotary drive shaft (**2**) and wherein an outer peripheral portion (**32**) of each of said plurality of blades (**10**, **11**, **12**) is in proximity with an inner surface of a casing (**20**), characterized in that:

said casing (**20**) extending in the direction of said rotary drive shaft **92**) has a bell mouth (**24**) fixed on a lower end of said casing (**20**) and a portion of said casing (**20**), surrounding said blades (**10**, **11**, **12**), has a configuration bulged in the form of a bowl;

said blades (**10**, **11**, **12**) are helical in configuration, and are arranged with their phases equidistantly shifted respectively about said rotary drive shaft (**2**);

each said helical blade has a forward end portion extending downwardly more than the lower end of said casing (**20**) and less than the lower end of said bell mouth (**24**);

a plurality of twisted guide vanes (**14**) is arranged at a flow passage in an upper portion above said helical blades (**10**, **11**, **12**) in said bowl-shaped configuration portion of said casing (**20**); and

said bowl-shaped configuration portion of said casing (**20**), by which said helical blade (**10**, **11**, **12**) and said guide vane (**14**) are surrounded, is divided at a location between said blades (**10**, **11**, **12**) and said guide vanes (**14**) and at an intermediate portion of said guide vanes (**14**), whereby said casing is formed by three portions.

5,487,645

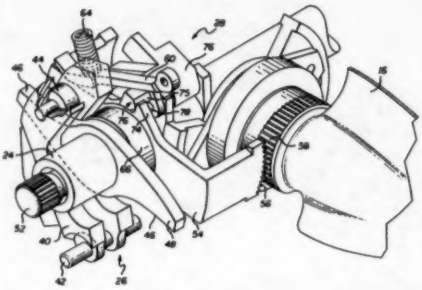
RAM AIR TURBINE WITH SECONDARY GOVENOR

Steven R. Eccles, Torrance, Calif., assignor to AlliedSignal Inc., Morris Township, N.J.

Filed Nov. 18, 1994, Ser. No. 341,718

Int. Cl.[6] F01D *7/02*

U.S. Cl. 416—51 **13 Claims**



1. A ram air turbine for deployment within an air stream to rotatably drive an output shaft, said ram air turbine comprising:

a rotary hub carried by said output shaft and having at least two turbine blades radiating outwardly therefrom, said turbine blade being supported by said hub to permit adjustment of blade pitch angle;

a primary governor coupled to said turbine blades and including first flyweight means responsive to hub rotation to adjust the blade pitch angle within a range of low to high pitch angles to maintain the rotational speed of said hub and the output shaft at a substantially constant operating speed; and

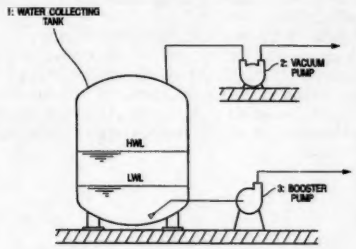
a secondary governor including shift means for shifting said turbine blades to a selected midrange pitch angle when said hub and the output shaft are in an at-rest condition, said midrange pitch angle being selected for faster acceleration of said hub and the output shaft from the at-rest condition on initial deployment, and said secondary governor further including means for disabling said shift means when said hub and the output shaft are accelerated to a selected rotational speed to permit subsequent speed control in response to operation of said primary governor.

5,487,646

VACUUM PUMP CONTROL APPARATUS FOR AN EVACUATING TYPE WASTE WATER COLLECTING SYSTEM

Akihiro Ushitora, Kanagawa; Kazuo Yamaguchi, Tokyo, and Tsuneo Asanagi, Kanagawa, all of, Japan, assignors to Ebara Corporayion, Tokyo, Japan

Continuation of Ser. No. 982,085, Nov. 25, 1992, which is a continuation-in-part of Ser. No. 619,118, Nov. 28, 1990, abandoned. This application Sep. 30, 1994, Ser. No. 316,715
Claims priority, application Japan, Nov. 30, 1989, 1313236
Int. Cl.[6] F04B *41/02;49/02*
U.S. Cl. 417—4 **14 Claims**



1. A vacuum pump control apparatus for an evacuating-type waste water collecting system in which waste water discharged from houses and facilities is transported to a water collecting tank by means of vacuum sewer pipes provided with a negative pressure therein, and in which the waste water collected in said water collecting tank is discharged by means of a booster pump while the air in said water collecting tank is discharged by means of a vacuum pump, said vacuum pump control apparatus comprising:

(a) gas-liquid ratio detection means for detecting the ratio of the amount of air to the amount of waste water to be collected into said water collecting tank; and

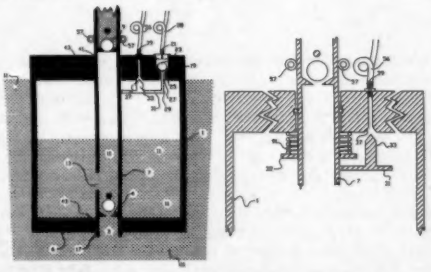
(b) control means linked to the detecting means for controlling the operating time of said vacuum pump determined by the gas-liquid ratio detected by said gas-liquid ratio detecting means so that a target value of said gas-liquid ratio is recovered when it falls below the target value to thereby maintain the gas-liquid ratio in said vacuum sewer pipes at said target value.

5,487,647

PNEUMATICALLY POWERED SUBMERSIBLE FLUIDS PUMP WITH CASING ACTIVATOR AND BIASING MEANS

Michael K. Breslin, 149 Shelley Dr., Mill Valley, Calif. 94941

Division of Ser. No. 325,856, Oct. 19, 1994, Pat. No. 5,470,206. This application Mar. 23, 1995, Ser. No. 409,384
Int. Cl.[6] F04F *1/06*
U.S. Cl. 417—131 **4 Claims**



1. A process for pumping of fluids to an opening in a discharge pipe utilizing a compressed gas power source comprising the steps of:

providing an enclosed buoyant casing having a top portion and a bottom portion;

mounting said enclosed buoyant casing for sliding sealed movement with respect to said discharge pipe between upper and lower positions;

providing an inlet to said enclosed buoyant casing, said inlet having means for allowing fluid to flow in and not out;

discharging air from an upper portion of said enclosed buoyant casing to flood said enclosed buoyant casing with fluid through said inlet to sink said enclosed buoyant casing to a lower position when said enclosed buoyant casing is in an upper position;

providing an outlet to said discharge pipe, said outlet having means for allowing fluid out to said discharge pipe but not in to said enclosed buoyant casing; and

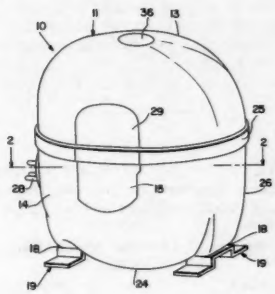
flooding said casing with compressed air when said enclosed buoyant casing moves to a lower position to force fluid within said enclosed buoyant casing out said outlet when said casing is in said lower position.

5,487,648

SHELL CONFIGURATION FOR A HERMETIC COMPRESSOR

Biagio Alfano, Milan, and Edoardo Biscaldi, Saronno, both of, Italy, assignors to Necchi Compressori S.r.l., Pavia, Italy

Filed Jun. 22, 1994, Ser. No. 310,309
Claims priority, application Italy, Nov. 12, 1993, PV93A0012
Int. Cl.[6] F04B *53/16*
U.S. Cl. 417—312 **8 Claims**



1. A hermetic motor compressor comprising a shell formed by an upper and a lower cap connected one to the other in such a way that an airtight closure is obtained in the shell, and by feet fixed to said lower cap for positioning said compressor in the correct position during its working, said lower cap defining non-flat opposing surfaces having a very large curvature radius in relation to a curvature radius of a circle circumscribing the largest cross-section of the lower cap connected to first, second, third and fourth curved surfaces, said first and second curved surfaces being connected to a flat surface and third and fourth curved surfaces being connected one to the other, said lower cap further defining a spherical-shape in a lower part thereof, and said upper cap defining a band on a lower part thereof to fit over an upper part of said lower cap.

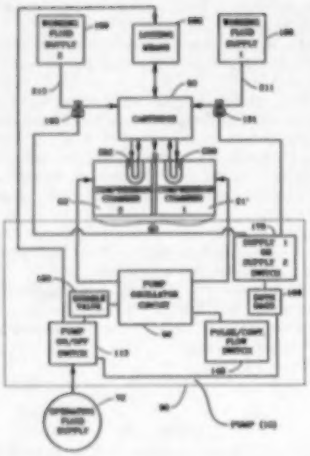
5,487,649

INFINITELY VARIABLE PNEUMATIC PULSATILE PUMP

James H. Dorsey, III, Lighthouse Point, Fla., and Joe E. West, Meridian, Tex., assignors to American Hydro-Surgical Instruments, Inc., Delray Beach, Fla.

Filed Sep. 29, 1993, Ser. No. 128,850
Int. Cl.[6] F04B *45/00;* **A61M** *1/00*
U.S. Cl. 417—395 **20 Claims**

1. A variable pneumatic pulsatile pump comprising:



a pump means including at least two pneumatically independent compression chambers independently and fluidly communicating with a supply of pressurized operating fluid;

a pneumatic control circuit in fluid communication with said pump means for controllably communicating said pump means with said pressurized operating fluid so as to variably and selectively supply and deprive said compression chambers with said pressurized operating fluid; and

at least one supply of working fluid to be selectively admitted to and ejected from said pump means in response to said pneumatic control circuit.

5,487,650

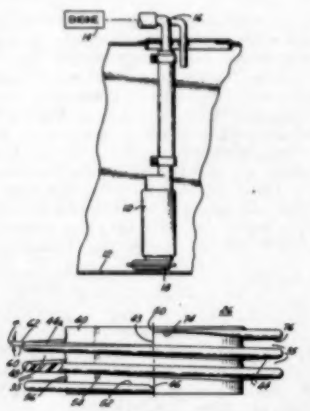
AUTOMOTIVE FUEL PUMP WITH HELICAL IMPELLER

Robert D. Gaston, Dearborn Heights, and Dequan Yu, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 7, 1993, Ser. No. 162,566

Int. Cl.[6] F03B *3/12*

U.S. Cl. 417—423.3 **17 Claims**



1. A fuel pump for supplying fuel from a fuel tank to an automotive engine, comprising:

a pump housing;

a motor mounted within a motor chamber within said housing and having a shaft extending therefrom;

an inlet in an end of said housing in fluid communication with said tank; and

a helically shaped pumping element fitted to said shaft between said inlet and said motor for pumping fuel in a generally axial direction from said tank, through said inlet, to said motor chamber, and to an outlet leading to said engine, with said pumping element being toleranced so as not to contact said pump housing;

said helically shaped pumping element comprising a helical blade making at least two turns around a longitudinal axis through said shaft, and wherein said at least two turns have a pumping face generally facing said motor and a back face generally facing said inlet;

so that fuel flows from said tank, through said inlet, and is scooped by said leading edge into an impeller inlet in said helically shaped pumping element defined by said leading edge, said housing, a hub fitted to said shaft and to which said blade is attached, and a back side of a blade turn adjacent said inlet blade turn, said back side of said blade generally facing said inlet.

5,487,651

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

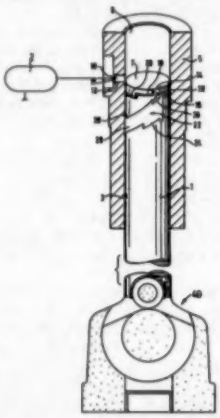
Josef Guentert, Gerlingen, and Hans Brett, Bietigheim-Bissingen, both of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 31, 1994, Ser. No. 220,650

Claims priority, application Germany, Mar. 31, 1993, 43 10 457.6

Int. Cl.[6] F02M *59/26*

U.S. Cl. 417—499 **5 Claims**



1. A fuel injection pump for internal combustion engines having a rotatable pump piston (**1**) axially guided in a cylinder bore (**3**) of a cylinder liner (**5**) and driven back and forth by a cam drive (**40**), said piston (**1**) with a face end (**7**) defines a pump work chamber (**9**) and which, on a jacket face, has a control opening (**22**) that communicates with the pump work chamber (**9**) and has an oblique control edge, said control edge cooperates with a control opening (**11**) in the wall of the cylinder liner (**5**) that leads from a low pressure chamber (**2**), wherein an edge of the face end (**7**) on the side of the pump piston (**1**) facing the pump work chamber (**9**), toward whose jacket face a first control edge (**14**) is formed that cooperates with the control opening (**11**) and that is defined on the piston circumference by means of a longitudinal groove (**16**) and, on its side remote from the longitudinal groove (**16**), has a second region, indented parallel with the piston's longitudinal axis toward

the cam drive side of the pump piston (**1**), forming a second control edge (**18**), the second control edge (**18**) transitions into an additional region, which is indented toward the drive end of the pump piston (**1**), and which region, with the jacket face of the pump piston (**1**), forms a third control edge (**20**), and that the oblique control edge, beginning at the level of the face-end control edges (**14**, **18**, **20**) at the longitudinal groove (**16**) and dropping off as it continues, is divided into two control edges, of which a first oblique control edge (**26**) begins at the longitudinal groove (**16**) and, at the level of the transition between the first face-end control edge (**14**) and the second face-end control edge (**18**), transitions via a shoulder (**32**) along the piston's longitudinal axis toward the pump work chamber (**9**) into a second oblique control edge (**30**), wherein the spacing between the second oblique control edge (**30**), at its end associated with the first oblique control edge (**26**), and the second face-end control edge (**18**) is smaller than the span of the piston longitudinally of the the control opening (**11**) in the wall of the cylinder liner (**5**).

5,487,652

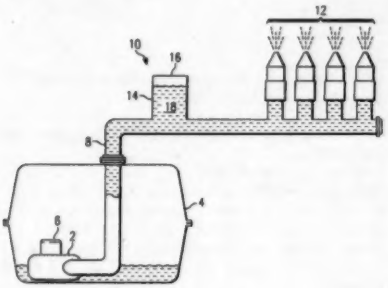
FUEL FLOW STABILIZER

Gil F. Shultz, Novi, Mich., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Mar. 5, 1993, Ser. No. 27,013

Int. Cl.[6] **F02M** *37/04*

U.S. Cl. 417—543 **2 Claims**



1. A fuel supply system for supplying liquid fuel to an engine of the type in which the fuel is delivered to said engine by fuel injectors, comprising:

a fuel pump;

a fuel delivery line connected between said fuel pump and said fuel injectors;

an accumulator in said fuel delivery line for accumulating a reserve amount of fuel in ordinary operation for ensuring that said fuel delivery line instantaneously supplies a required amount of fuel to the injectors in response to a sudden demand for additional fuel, said accumulator comprising a sealed tank containing said reserve amount of fuel and an amount of air that expands and compresses in response to pressure exerted by fuel in said fuel line; and

means for resupplying air from a fuel tank to said accumulator when said fuel supply system is inoperative;

wherein said accumulator supplies fuel from said reserve amount of fuel to said fuel line in response to a sudden demand for fuel which cannot immediately be satisfied by said fuel pump;

and wherein said accumulator receives excess fuel from said fuel line in response to a sudden decrease in the demand for fuel which cannot be satisfied by said fuel pump.

5,487,653

AXIAL LEAKAGE RESISTANT APPARATUS OF SCROLL-TYPE COMPRESSOR

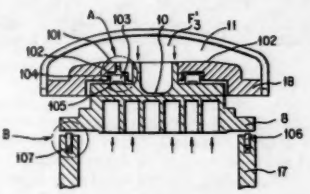
Byung C. Lee, Seoul, Rep. of Korea, assignor to Goldstar Co. Ltd., Seoul, Rep. of Korea

Filed Aug. 12, 1994, Ser. No. 288,794

Claims priority, application Rep. of Korea, Aug. 17, 1993, 1993-15922

Int. Cl.[6] **F04C** *18/04*

U.S. Cl. 418—14 **4 Claims**



1. An axial leakage resistant apparatus of a scroll compressor having an upper fixed scroll connected to a main frame, and a lower orbiting scroll, said apparatus comprising:

a pressurization means for pressurizing the fixed scroll by using a part of the refrigerant gas of high pressure in an exhalation chamber; said pressurization means include a high pressure bore interconnecting the exhalation chamber and a high pressure chamber for passing the high pressure refrigerant gas from said exhalation chamber to said high pressure chamber, and a pressurization element in said high pressure chamber for pressurizing said fixed scroll toward said orbiting scroll in response to said high pressure refrigerant in said high pressure chamber, and

supporting means including pins fitted in holes in said fixed scroll and said main frame, and elastic members for supporting said fixed scroll through said pins by buffing said pins with elastic force.

5,487,654

HERMETIC COMPRESSOR WITH HEAT SHIELD

Frank S. Wallis; Timothy R. Houghtby; Kenneth J. Monnier, all of Sidney, Ohio, and Roger C. Weatherston, East Amherst, N.Y., assignors to Copeland Corporation, Sidney, Ohio

Division of Ser. No. 95,185, Jul. 23, 1993, Pat. No. 5,358,391, which is a continuation-in-part of Ser. No. 978,947, Nov. 18, 1992, abandoned, and a continuation-in-part of Ser. No. 998,557, Dec. 30, 1992, abandoned, which is a division of Ser. No. 884,412, May 18, 1992, Pat. No. 5,219,281, which is a division of Ser. No. 649,001, Jan. 31, 1991, Pat. No. 5,114,322, which is a division of Ser. No. 387,699, Jul. 31, 1989, Pat. No. 4,992,033, which is a division of Ser. No. 189,485, May 2, 1988, Pat. No. 4,877,382, which is a division of Ser. No. 899,003, Aug. 22, 1986, Pat. No. 4,767,293. This application Aug. 31, 1994, Ser. No. 298,658

Int. Cl.[6] **F04C** *18/04;29/04;* **F04B** *39/06*

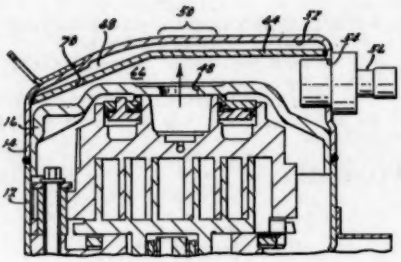
U.S. Cl. 418—55.1 **20 Claims**

1. A hermetic compressor comprising:

(a) a hermetic shell defining an enclosed chamber and having an exit port;

(b) a muffler plate dividing said enclosed chamber into a compressor chamber and a plenum chamber;

(c) a gas compressor disposed in said compressor chamber having a discharge port from which relatively hot compressed gas is discharged, said port being positioned so that said hot compressed gas is discharged into said plenum chamber in a direction toward a local area on an interior surface of said shell; and



(d) a heat shield spaced apart from said muffler plate and disposed between said port and said local area to insulate said local area from the relatively high temperature of said discharge gas, said shield being formed as a diaphragm affixed to said shell and defining an insulating chamber between said shield and said shell, said heat shield being formed having no flow passage in a flow path between said discharge port and said exit port.

5,487,655

METHOD OF AND APPARATUS FOR PRODUCING A SPUN FILAMENT WEB

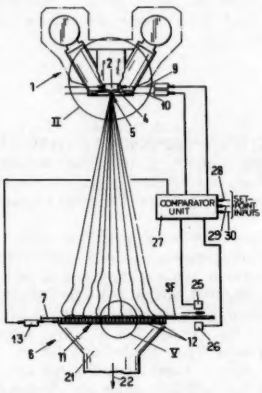
Detlef Frey, Troisdorf, and Bernd Masbach, Siegburg, both of, Germany, assignors to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Germany

Filed Apr. 11, 1994, Ser. No. 226,598

Claims priority, application Germany, Apr. 15, 1993, 43 12 309.0

Int. Cl.[6] B29B *13/02;* **B29C** *33/02*

U.S. Cl. 425—72.2 **6 Claims**



1. A spin-blowing apparatus for producing a nonwoven spun-filament web, comprising:

a spinneret in a form of an orifice plate at a temperature constituting a first parameter and having a multiplicity of orifices for feeding a thermoplastified synthetic resin downwardly in respective filaments;

a filament-blowing head provided with a slot-shaped outlet gap adjacent said orifice plate and formed with means for entraining said filaments in flat filament-blowing streams of air directed at said filaments in a downwardly moving curtain of filaments and air through said slot-shaped outlet gap, said gap having a length corresponding to a width of a web to be produced, said outlet gap having a gap width constituting a second parameter;

means including a continuously moving sieve belt for collecting said curtain of filaments below said head to form a nonwoven web of said filaments of said curtain on said belt with properties of weight per unit area and air permeability of the web, air flow resistance through said belt constituting a third parameter; and

control means operable during formation of said web on said belt for continuously controlling at least one of said parameters to regulate at least one of said properties, said plate in a region of said orifices being subdivided into separately controllable heated zones across said width of the web, said one of said parameters being said first parameter, temperatures of said zones being independently controlled in response to said deviation of said actual value from said set-point value.

5,487,656

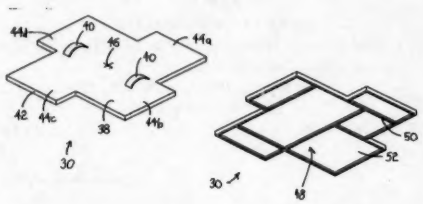
DECORATIVE FORMING APPARATUS

Michael A. Kaitanjian, 16067 Arbela Dr., Whittier, Calif. 90603

Filed May 16, 1994, Ser. No. 242,273

Int. Cl.[6] B29C *59/02;* **E01C** *23/02*

U.S. Cl. 425—385 **5 Claims**



1. A tool for forming imprints in a deformable material, comprising:

an upper support plate;

a rectilinear outline having four identically shaped outwardly extending legs;

a lower forming surface; and

a center point, wherein said tool can be rotated 90° from a first position where it forms a first outline pattern to a second position about said center point where it forms a second outline pattern such that said second outline pattern is identical to said first outline pattern in both the first and second positions.

5,487,657

SELECTIVELY ACTUATABLE LIGHTER

Floyd B. Fairbanks, Naugatuck; Thomas G. Snell, Madison, and James M. McDonough, Guilford, all of Conn., assignors to BIC Corporation, Milford, Conn.

Continuation of Ser. No. 912,421, Jul. 10, 1992, abandoned, which is a continuation of Ser. No. 609,668, Nov. 6, 1990, abandoned, which is a continuation of Ser. No. 239,734, Sep. 2, 1988, Pat. No. 5,002,482. This application Jun. 3, 1993, Ser. No. 71,863

The portion of the term of this patent subsequent to Mar. 26, 2008, has been disclaimed.

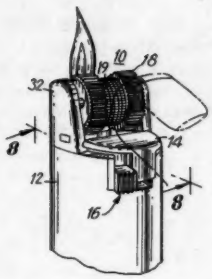
Int. Cl.[6] F23D *11/36*

U.S. Cl. 431—153 **10 Claims**

1. A lighter having a fuel cutoff mechanism, said mechanism comprising:

a depressible valve actuator pivotably mounted on the lighter which, upon depression, actuates a fuel supply thereby permitting fuel to flow out from said fuel supply;

a latch member which is normally positioned beneath a portion of said valve actuator to prevent depression of said depressible valve actuator, said latch member having an integral finger actuatable portion manipulable along a first cross-wise



direction and a second direction by a user to a position which permits depression of said valve actuator; and

wherein such selective actuation of said fuel supply and a corresponding production of sparks by a spark-producing assembly ignites fuel from said fuel supply, and wherein said cross-wise direction is a direction substantially perpendicular to a longitudinal axis defined by a top end and a bottom end of the lighter.

5,487,658

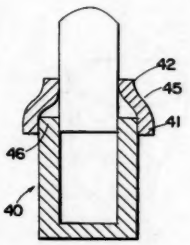
SAFETY DEVICE FOR NOVELTY CANDLE HOLDERS

Seungsoo Lee, 808 Pony Trail, Franklin Lakes, N.J. 07417

Continuation-in-part of Ser. No. 37,302, Mar. 26, 1993, Pat. No. 5,363,590. This application Sep. 14, 1994, Ser. No. 306,109

Int. Cl.[6] F23D *3/16*

U.S. Cl. 431—253 **14 Claims**



1. A safety device for a candle-flame activatable electronic device, said electronic device being enclosed in a flammable housing and said housing having a candle housing section that holds a candle, wherein said safety device comprises a nonflammable elongated hollow structure which has an upper and a lower section and two open ends, said upper and lower sections having an inner surface and an outer surface, wherein the contour of said inner surface of said upper section conforms to the circumferential contour of said candle and the contour of said inner surface of said lower section conforms to the outer circumferential contour of said candle holding section.

5,487,659

FUEL LANCE FOR LIQUID AND/OR GASEOUS FUELS AND METHOD FOR OPERATION THEREOF

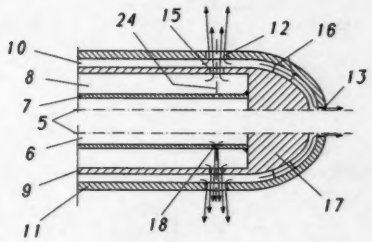
Adnan Eroglu, Untersiggenthal, Switzerland; Franz Joos, Weilheim-Bannholz, Germany; Peter Novacek, Gebenstorf, and Peter Senior, Mellingen, both of, Switzerland, assignors to ABB Management AG, Baden, Switzerland

Filed Jun. 20, 1994, Ser. No. 262,454

Claims priority, application Germany, Aug. 10, 1993, 43 26 802.1

Int. Cl.[6] F23D *14/46*

U.S. Cl. 431—350 **20 Claims**



1. A fuel lance for liquid and/or gaseous fuels for use in a combustion chamber, which fuel lance comprises:

(a) a liquid fuel pipe extending along a lance center line and surrounding a liquid fuel passage for carrying a liquid fuel;

(b) a gas pipe surrounding the liquid fuel pipe and forming therebetween a gas passage for carrying a gaseous fuel;

(c) a lance outer shell surrounding the gas pipe and forming an air passage around the gas pipe for carrying cooling air and atomizer air;

(d) at least one air/fuel nozzle provided in a side of the lance outer shell at a downstream end of the fuel lance for air flow out of the air passage into the combustion chamber surrounding the fuel lance;

(e) at least one gas nozzle provided in the gas pipe for gas flow out of the gas passage into the air passage, wherein the at least one gas nozzle is positioned relative to the at least one air/fuel nozzle so that gas from the gas nozzle flows with air from the air passage through the at least one air/fuel nozzle into the combustion chamber; and

(f) at least one liquid fuel nozzle provided in the liquid fuel pipe for liquid fuel flow out of the liquid fuel passage the at least one liquid fuel nozzle being positioned relative to the at least one gas nozzle and at least one air/fuel nozzle so that liquid fuel from the liquid fuel nozzle flows through the air passage and, with the air, through the at least one air/fuel nozzle into the combustion chamber.

16. A method of operating a fuel lance, including a liquid fuel pipe extending along a lance center line and defining a liquid fuel passage and having at least one liquid fuel nozzle for liquid fuel flow out of the liquid fuel passage, a gas pipe surrounding the liquid fuel pipe and forming therebetween a gas passage and having at least one gas nozzle for gas flow out of the gas passage into the air passage, and a lance outer shell Surrounding the gas pipe and forming an air passage around the gas pipe for cooling air and atomizer air and having at least one air/fuel nozzle in a peripheral side of the lance outer shell at a downstream end of the fuel lance for air flow out of the air passage into the combustion chamber, wherein the gas nozzle is positioned relative to the air/fuel nozzle so that gas from the gas nozzle flows with air from the air passage through the at least one air/fuel nozzle into the combustion chamber and the liquid fuel nozzle is positioned relative to the gas nozzle and air/fuel nozzle so that liquid fuel from the liquid fuel nozzle flows through the air passage and with the air, through the air/fuel nozzle into the combustion chamber the method comprising the steps of:

directing air through the air passage to the air/fuel nozzle to cool the fuel lance and distribute fuel and

wherein the air is blown through the air/fuel nozzle into the combustion chamber as a flow jacketing the fuel flow.

5,487,660

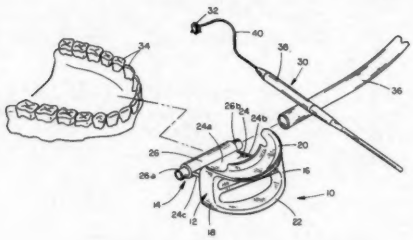
ORTHODONTIC APPARATUS

Jackson J. Good, 501 N. 13th St., Norfolk, Nebr. 68701

Filed Aug. 12, 1994, Ser. No. 290,490

Int. Cl.[6] A61C *3/00;5/00*

U.S. Cl. 433—3 **15 Claims**



1. An orthodontic apparatus comprising:

an upper lip support connected to and spaced vertically above a lower lip support;

a generally horizontal, flat platform affixed generally midway between the upper and lower lip supports; and

a pair of generally vertical, spaced apart walls interconnecting the upper and lower lip supports and forming an access opening between said walls and lip supports for access to a patient's teeth above and below said platform.

5,487,661

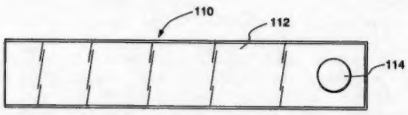
PORTABLE DENTAL CAMERA AND SYSTEM

Keith C. Peithman, York, Pa., assignor to Dentsply International, Inc., York, Pa.

Filed Oct. 8, 1993, Ser. No. 134,158

Int. Cl.[6] A61C *1/00;1/16*

U.S. Cl. 433—29 **6 Claims**



1. A Combination comprising a dental camera handpiece and a flexible dental camera cover having an elongated generally cylindrical body wall and

a lens,

said lens being supported by said body wall, said dental handpiece having a charge coupled device and a prism, said lens being positioned to refract light onto said prism, said prism being positioned to reflect said refracted light onto said charge coupled device.

5,487,662

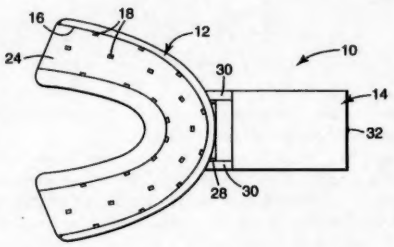
DENTAL IMPRESSION TRAY FOR PHOTOCURABLE IMPRESSION MATERIAL

Cary A. Kipke, Woodbury, and James G. Bentsen, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 22, 1994, Ser. No. 216,148

Int. Cl.[6] A61C *1/00;3/00;5/00;9/00*

U.S. Cl. 433—37 **27 Claims**



1. A dental impression tray comprising:

a body having a channel for receiving a quantity of photocurable dental impression material; and

at least one solid state light emitter mounted on said body for curing dental impression material in said channel, wherein said at least one solid state light emitter emits light having a wavelength in the range of about 630 to 980 nanometers.

5,487,663

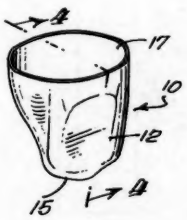
ORAL APPLIANCES AND METHOD

George M. Wilson, 1536 Goddard Dr., Visalia, Calif. 93277

Continuation of Ser. No. 106,580, Aug. 16, 1993, abandoned. This application Dec. 15, 1994, Ser. No. 357,074

Int. Cl.[6] A61C *5/08*

U.S. Cl. 433—218 **12 Claims**



1. A dual purpose dental appliance for forming a crown or serving as one, comprising:

a jacket formed of a flexible resin material, said jacket being of a generally cylindrical configuration with parallel side walls and having one end thereof closed to define a cup-like receptacle,

a coating of bonding agent on the inner walls of said cup-like receptacle, and a predetermined quantity of composite restorative material disposed in said receptacle,

said jacket being of such size as to fit over a prepared tooth, to thereby provide a crown on said tooth.

5,487,664
DENTAL POST PROVIDED WITH SUPPORT FRAME

Bernard Weissman, 225 E. 48th St., New York, N.Y. 10017

Filed Aug. 18, 1994, Ser. No. 292,259
Int. Cl.[6] A61C 5/08
U.S. Cl. 433—221 19 Claims

1. A dental post for retaining a dental restoration on a prepared tooth stub having a canal therein, said dental post comprising:

an elongated body;

first means for matchingly fitting into the tooth canal, said first means including a smooth cone-shaped lower end portion;

second means for coacting with a securing material to prevent said dental post from being pulled out of the tooth canal, and also for permitting said dental post to be retrieved from the tooth canal, said second means including a threaded portion for engagement with the securing material while allowing said threaded portion to be unscrewed from the securing material for removing said dental post from the tooth canal;

third means for facilitating the unscrewing of said threaded portion from the securing material, said third means being a non-circular portion;

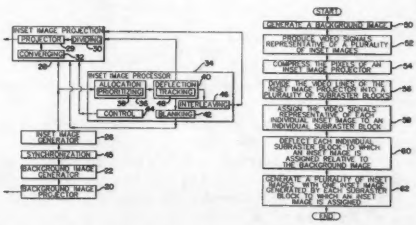
said threaded portion being disposed between said smooth cone-shaped lower end portion and said non-circular portion; and

engagement means being disposed at a free top end of said elongated body for interlocked engagement with a support frame disposed on the tooth stub and straddling an upper part of said dental post, said engagement means including a chisel-like portion.

5,487,665
VIDEO DISPLAY SYSTEM AND METHOD FOR GENERATING AND INDIVIDUALLY POSITIONING HIGH RESOLUTION INSET IMAGES

Robert J. Lechner, St. Charles County, and Harold R. Streid, St. Louis County, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Oct. 31, 1994, Ser. No. 331,418
Int. Cl.[6] G09B 9/08;19/16
U.S. Cl. 434—44 23 Claims


INSET IMAGE PROJECTION
PROJECTOR
DIVERGING
CONVERGING
INSET IMAGE PROCESSOR
ALLOCATION PROCESSING
DEFLECTION PROCESSING
CONTROL
BLANKING
INSET IMAGE GENERATOR
SYNCHRONIZATION
BACKGROUND IMAGE GENERATOR
BACKGROUND IMAGE PROJECTOR
START
GENERATE A BACKGROUND IMAGE
PRODUCE VIDEO SIGNALS REPRESENTATIVE OF A PLURALITY OF INSET IMAGES
COMPRESS THE SIZES OF AN INSET IMAGE PROJECTOR
DIVIDE THE VIDEO LINES OF THE INSET IMAGE PROJECTOR INTO A PLURALITY OF SUBRASTER BLOCKS
ASSIGN THE VIDEO SIGNALS REPRESENTATIVE OF EACH INDIVIDUAL INSET IMAGE TO AN INDIVIDUAL SUBRASTER BLOCK
DEFLECT EACH INDIVIDUAL SUBRASTER BLOCK TO WHICH AN INSET IMAGE IS ASSIGNED RELATIVE TO THE BACKGROUND IMAGE
GENERATE A PLURALITY OF INSET IMAGES WITH THE INSET IMAGE GENERATED BY EACH SUBRASTER BLOCK DEFLECTED OR INSET IMAGE ASSIGNED
END

1. A visual display system comprising:

background image projection means for generating a background image having a predetermined size and resolution;

inset image generation means for producing video signals representative of a plurality of inset images;

inset image projection means, responsive to said inset image generation means, for generating a plurality of inset images, each having a smaller size and a higher resolution than the background image, in response to the video signals produced by said inset image generation means, said inset image projection means including:

an inset image projector having a plurality of video lines; and

dividing means for dividing the plurality of video lines into a plurality of subraster blocks wherein each subraster block can generate an inset image; and

inset image processing means, responsive to said inset image generation means, for controlling the generation of inset images by said inset image projection means, said inset image processing means including: allocation means for assigning the video signals representative of each individual inset image to an individual subraster blocks of said inset image projector; and deflection means, responsive to said allocation means, for producing positioning signals corresponding to the individual positions of each of the subraster blocks to which an inset image is assigned by said allocation means relative to the background image.

17. A method of displaying a composite video image having a plurality of inset images and a background image wherein the inset images are smaller and of a higher resolution than the background image, the method comprising the steps of:

generating a background image having a predetermined size and resolution;

producing video signals representative of a plurality of inset images, each having a smaller size and a higher resolution than the background image;

dividing the plurality of video lines of an inset image projector into a plurality of subraster blocks;

assigning the video signals representative of each individual inset image to an individual subraster block;

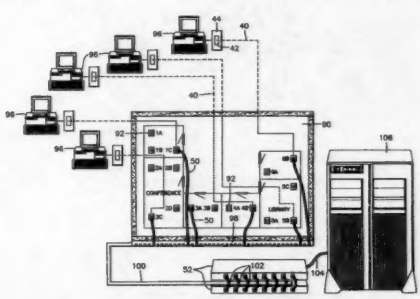
generating a plurality of inset images in response to the assigned video signals wherein one inset image is generated by each subraster block; and

deflecting each individual subraster blocks relative to the background image.

5,487,666
SCHEMATIC PATCH PANEL

Thomas H. DiGiovanni, 11 Earth Star Place, Gaithersburg, Md. 20878

Continuation-in-part of Ser. No. 815,156, Dec. 31, 1991, Pat. No. 5,291,377. This application Feb. 1, 1994, Ser. No. 189,834
Int. Cl.[6] G09B 25/00
U.S. Cl. 434—72 14 Claims



1. A patch panel for a computer local area network, said patch panel comprising:

a panel including a plurality of openings,

a plurality of removably secured cover plates inserted into and secured to said plurality of openings and having a facing surface of each cover plate forming a continuous mounting surface, and

a schematic floor plan representative of a building site located on said continuous mounting surface formed by said facing Surfaces of said cover plates located in said plurality of openings to schematically identify locations of wall outlets of said building site and for facilitating easily changing locations of computers in a local area network.

10. A local area network of computer terminals, said local area network comprising:

a network central controller,

a patch panel including a support surface and a schematic floor plan representative of a building site located above said support surface and having marked locations representative of wall outlets, said support surface having a plurality of openings covered with a plurality of removably secured cover plates inserted into and secured to said plurality of openings and having a facing surface of each cover plate foxing a continuous mounting surface and said schematic floor plan being located on said continuous mounting surface,

a plurality of wall outlets for connection of a computer terminal to said patch panel,

cable lines interconnecting said plurality of wall outlets to a corresponding marked location on said schematic floor plan of said patch panel representative of a location of each wall outlet,

a connector at each end of each of said cable lines located at said wall outlets and in one of said openings of said support surface, and

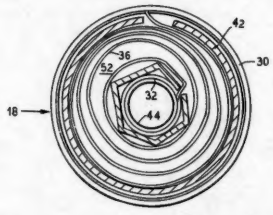
a cable extension connected between said network central controller and said connector located at said patch panel so that upon connection of a computer terminal with a wall outlet at said connector of one of said cable lines, said computer terminal will be networked with said network central controller and said computer terminal once changed in location in the local areal network is easily changed in connection at the patch panel according to the schematic floor plan.

5,487,667

AUTOMOBILE CLOCKSPRING WITH VIBRATION DAMPENER

Patrick A. Bolen, Carthage, Ill., assignor to Methode Electronics, Inc., Chicago, Ill.

Filed Mar. 11, 1994, Ser. No. 209,967
Int. Cl.[6] H01R *35/04*
U.S. Cl. 439—164 **10 Claims**



1. A clockspring interconnector comprising:

a housing having a housing wail;

said housing wall defining a chamber;

a rotor hub attached to said housing;

a flat conductor cable coiled within said chamber having a first end and a second end;

said first end attached to said rotor hub;

said second end attached to said housing; and

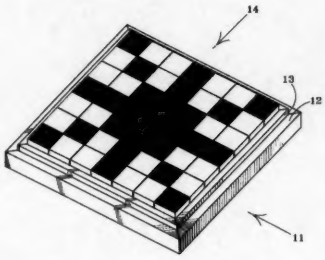
a vibration dampener adjacent to and compressing said flat conductor cable and having a generally cylindrical shape, encircling the majority of said chamber.

5,487,668

SET OF BLOCKS FOR MAKING DESIGNS

Margaret A. Oyen, Rhinebeck, and Linda Baldwin, Pine Plains, both of N.Y., assignors to Mill Hill Factory, Inc., Rhinebeck, N.Y.

Filed Nov. 9, 1993, Ser. No. 150,394
Int. Cl.[6] G09B *19/00*
U.S. Cl. 434—98 **11 Claims**



1. A designing set comprising:

a plurality of cubes, each cube having six faces;

a work base having an area with an odd number of spaces designated thereon for deposit of the cubes thereon, one in each space,

the spaces on the base being the same in number as the number of cubes,

each face of each of the cubes being distinguished from each other face of the cube by a color different from colors distinguishing each other face of the cube,

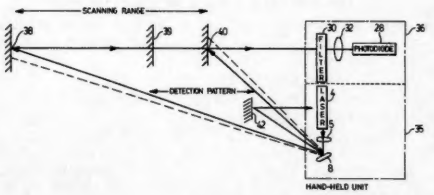
one face of half of the cubes plus one of the cubes being distinguished by one or the other of the colors black or white, and one face of the remaining cubes being distinguished by the other of the colors black or white, and no face of the remaining cubes being distinguished by the color that distinguishes said one face of the said half of the cubes.

5,487,669

MOBILITY AID FOR BLIND PERSONS

George F. Kelk, 11 Pine Forest Road, Toronto, Ontario, Canada

Continuation-in-part of Ser. No. 28,218, Mar. 9, 1993, abandoned. This application Jul. 7, 1993, Ser. No. 87,342
Int. Cl.[6] A61H *3/00*
U.S. Cl. 434—112 **8 Claims**



1. A hand-held mobility aid for determining the positions of objects relative to a user, comprising:

means for transmitting laser radiation at a range of angles so as to scan a predetermined sector at a predetermined rate;

means for receiving said laser radiation reflected from an object;

scanning triangulation means responsive to the reflected radiation for continuously determining the distance of said object from the mobility aid;

means for producing an audible tone corresponding continuously to the distance of said object from the mobility aid; and

means for transmitting said audible tone or tones from said producing means to a user, said mobility aid being adapted to fit in the hand of said user allowing said user to hand scan an area wherein

said means for transmitting laser radiation comprises:

(a) a laser diode and lens;

(b) a pulse generator operating at a predetermined frequency stimulating said laser diode so as to produce pulses of laser radiation;

(c) an oscillating mirror/magnet assembly receiving said pulses of laser radiation and oscillating at a predetermined resonant frequency such that reflected laser radiation is transmitted; and

(d) means for generating a signal at said predetermined resonant frequency for oscillating said oscillating mirror/magnet assembly;

wherein said means for receiving said laser radiation comprises:

(a) a filter admitting radiation at the wavelength of the laser radiation;

(b) a lens for focusing said admitted radiation; and

(c) a photodetector for converting said admitted radiation into photocurrent;

and wherein said scanning triangulation means comprises:

(a) a synchronous detector receiving said photocurrent and said pulse generator signal and producing a demodulated signal;

(b) a phase-to-voltage converter sampling said oscillating signal at time intervals determined by said demodulated signal and time averaging said sampled signal; and

(c) a voltage-to-frequency converter converting said integrated signal into an audio signal having a frequency proportional to the voltage of said time averaged signal,

said means for producing an audible tone comprising an audio amplifier amplifying said audio signal in an audio band.

5,487,670

DYNAMIC LANGUAGE TRAINING SYSTEM

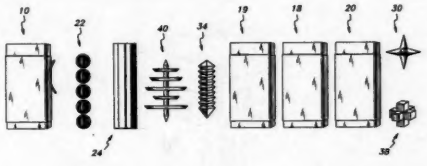
Helga F. Leonhardt, 640 San Elijo St., San Diego, Calif. 92106

Continuation-in-part of Ser. No. 424,716, Oct. 20, 1989, abandoned. This application Aug. 8, 1991, Ser. No. 742,403

The portion of the term of this patent subsequent to Mar. 1, 2011, has been disclaimed.

Int. Cl.[6] G09B *1/00*

U.S. Cl. 434—167 **18 Claims**



1. An educational method for teaching the functions, interrelationships and interaction between the parts of a natural human language, comprising the steps of:

providing a plurality of objects of differing and unique geometrical shapes, each part of speech of said natural human language being represented by an object of a different unique geometrical shape;

selecting a clause with a plurality of words;

assigning appropriate ones of said objects to represent each of said plurality of words, the shape of each one of said appropriate ones of said objects corresponding to the part of speech of the word represented;

displaying said appropriate ones of said objects in combination with the represented words;

arranging said appropriate ones of said objects in accordance with a predetermined grammatical pattern based on grammatical rules of said natural human language to form the clause; and

causing said appropriate ones of said objects to undergo animated shape changes and animated interaction between the appropriate ones of said objects, said animated shape changes and animated interactions representing symbolically the actions performed on or by, and the interactions between, the plurality of words in the clause.

5,487,671

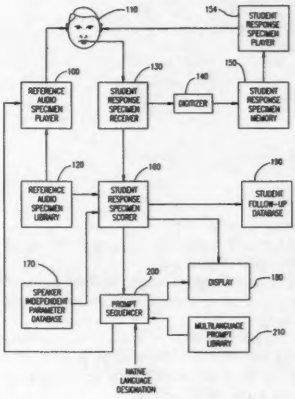
COMPUTERIZED SYSTEM FOR TEACHING SPEECH

Zeev Shpiro, Tel Aviv, Israel; Gabriel F. Groner, Palo Alto, Calif., and Erik Ordentlich, Huntingdon Valley, Pa., assignors to DSP Solutions (International), Hamilton, Bermuda

Filed Jan. 21, 1993, Ser. No. 7,242

Int. Cl.[6] G09B *5/00*

U.S. Cl. 434—185 **26 Claims**



1. Apparatus for interactive speech training comprising:

an audio specimen generator for playing a pre-recorded reference audio specimen to a user for attempted repetition thereby;

a reference audio specimen library in which reference audio specimens are stored and to which the audio specimen generator has access, wherein said audio specimen library comprises a multiplicity of recordings of speaker dependent audio specimens produced by a plurality of speech models;

a speaker independent parameter database storing a plurality of speaker independent references which are different from the reference audio specimens stored in said reference audio specimen library; and

an audio specimen scorer for scoring a user's repetition audio specimen by comparison of at least one parameter of the user's repetition audio specimen with a speaker independent reference, said speaker independent reference being characterized in that it is classified in a category according to at least one of age, gender and dialect categories.

5,487,672

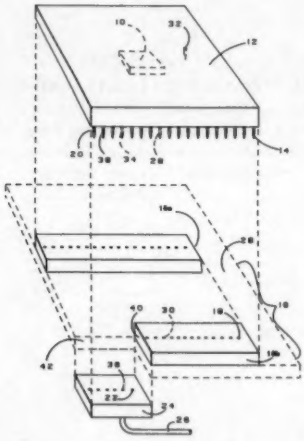
Patent Not Issued For This Number

5,487,673

PACKAGE, SOCKET, AND CONNECTOR FOR INTEGRATED CIRCUIT

Jorge S. Hurtarte, La Mirada, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Dec. 13, 1993, Ser. No. 165,608
Int. Cl.[6] H01R *9/09*
U.S. Cl. 439—69 **3 Claims**



1. A combination comprising:

(a) a package containing an integrated circuit, the package including a plurality of pins;

(b) a socket which includes means defining a plurality of holes, some of which are situated to engaged complementary pins of the package;

(c) a cable connector which includes means defining a plurality of holes, some of which are situated to engaged complementary pins of the package, different from the pins situated to engage the holes of the socket;

(d) a motherboard mounting the socket; and

(e) means defining a hole in the motherboard opposite the pins complementary to the cable connector.

5,487,674

SURFACE MOUNTABLE LEADED PACKAGE

Andrzej T. Guzik, Pompano Beach; Todd L. Smith, and Jeffrey P. Marchuk, both of Ft. Lauderdale, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

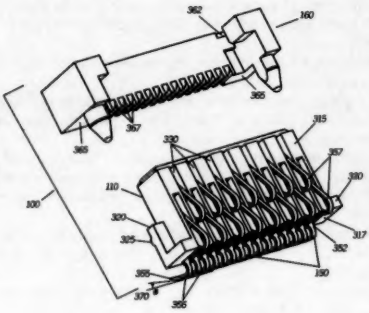
Filed Jul. 6, 1993, Ser. No. 85,806
Int. Cl.[6] H01R *4/02*
U.S. Cl. 439—83 **2 Claims**

1. A surface mountable connector having a plurality of leads coplanar in a target plane, comprising:

a housing having a connector interface surface and a mounting surface, the housing having lead slots extending to the mounting surface, the housing having an integral guide rail and a first retainer portion;

a plurality of leads mounted within the lead slots, said plurality of leads having free end portions exiting the mounting surface of the housing, said free end portions being preformed to angle away from the target plane and toward the mounting surface;

a correction bar mounted on said housing along the guide rail, the correction bar having a second retainer portion that cooperates with the first retainer portion to secure the correction bar to the housing, the correction bar engaging said free end portions and biasing said free end portions toward the target plane to form a coplanar contact surface for mounting the



connector, said correction bar having positioning notches for limiting lateral movement of said free end portions;

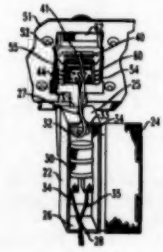
wherein at least one of the first and second retainer portions comprises a protrusion that engages the other retainer portion in a snap fit arrangement.

5,487,675

INTEGRATED PROTECTOR AND MODULAR JACK

Bassel Hage Daoud, Parsippany Township, Morris County, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Sep. 26, 1994, Ser. No. 311,987
Int. Cl.[6] H01R *13/74;13/648*
U.S. Cl. 439—95 **13 Claims**



8. A customer bridge assembly comprising:

a jack adapted for mounting in an aperture in a chassis;

a housing mechanically attached to the jack, the housing including a surge protector with a ground contact therein; and

a contact member electrically coupled to the ground contact and attached to the jack, the contact member including at least one contact finger extending from at least one side of the member and adapted to make electrical contact with a conductive member extending essentially perpendicular to a major surface of the chassis.

5,487,676

SPARK PLUG CAP WITH IGNITION VOLTAGE DETECTIVE CAPACITOR FOR INTERNAL COMBUSTION ENGINE

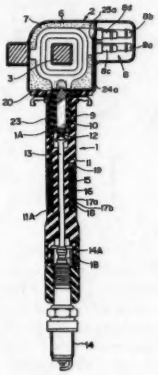
Shigeru Maruyama; Yuichi Shimasaki; Masaki Kanehiro; Takashi Hisaki; Shigeki Baba; Takuji Ishioka; Jiro Takagi, and Eitetsu Akiyama, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1993, Ser. No. 149,378

Claims priority, application Japan, Nov. 10, 1992, 4-326167

Int. Cl.[6] F02P *17/00*

U.S. Cl. 439—125 **17 Claims**



1. A spark plug cap covering the terminal of a spark plug for an internal combustion engine, including;

an insulative cap body;

a case for housing an ignition coil to be attached to the insulative cap body and having a terminal for the ignition coil;

a first conductor housed in the insulative cap body for carrying an ignition voltage produced by the ignition coil to the spark plug terminal; and

a second conductor located around the first conductor keeping a predetermined distance therefrom while sandwiching an insulative material therebetween such that a capacitor is formed between the first and second conductors for detecting the ignition voltage;

wherein the improvement comprises;

a first contact provided at the end of said insulative cap body and electrically connected with said second conductor; and

a second contact electrically connected with the terminal of said case such that the second contact is brought into contact with the first contact when said case is attached to said insulative cap body.

5,487,677

HERMAPHRODITE ELECTRICAL CONNECTOR

Max Hoffner, Hirsingue, France, assignor to Maxi System International S.A., Mulhouse, France

PCT No. PCT/FR92/00755, § 371 Date Jan. 31, 1994, § 102(e) Date Jan. 31, 1994, PCT Pub. No. WO93/03515, PCT Pub. Date Feb. 18, 1993

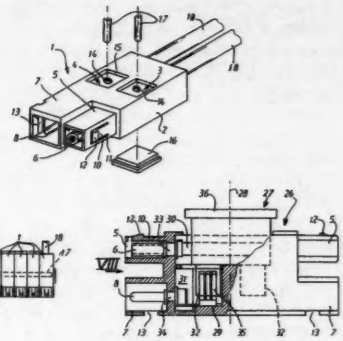
PCT Filed Jul. 31, 1992, Ser. No. 190,174

Claims priority, application France, Aug. 8, 1991, 91 10228

Int. Cl.[6] H01R *13/627;23/27*

U.S. Cl. 439—293 **12 Claims**

1. Hermaphrodite electrical connector (**1**, **21**, **22**, **23**, **26**) comprising at least one female contact part (**3**, **33**) fitted with a socket (**6**) arranged to fit longitudinally onto a pin of a male contact part of another similar connector, at least one male contact part (**4**, **34**) with a pin (**8**) arranged to fit longitudinally into the socket (**6**) of the female contact part of a another similar connector, and an oblong insulating case (**2**, **24**, **29**) which laterally surrounds the



said contact parts and which presents, close to the pin and the socket, male and female sections arranged to fit into and onto the corresponding sections of the said similar connector turned of 180°, characterised in that:

the said male and female sections of the case comprise two tubular protection and insulating sections (**5**, **7**), which form an integral part of the case (**2**, **24**, **29**), the male tubular section (**5**) surrounding the socket (**6**) and the female tubular section (**7**) surrounding the pin (**8**);

the case (**2**, **24**, **29**) comprises, on the said male and female tubular sections (**5**, **7**) locking members comprised of a resilient tab (**10**) with a lug (**12**) on one side of the case and a lateral recess on the opposite side of the case to receive the said lug of the other similar connector; and

the said resilient tab (**10**) is provided in a wall of the male tubular section (**5**), with its lug (**12**) pointing outwards, and the said lateral recess (**13**) is an orifice provided in a wall of the female tubular section (**7**).

5,487,678

CONNECTOR HOUSING HAVING A LOCK MECHANISM

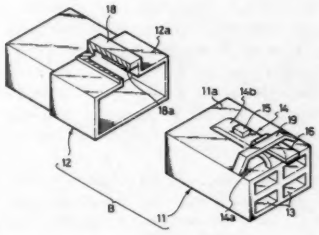
Masanori Tsuji; Motohisa Kashiyama, and Takuya Kitamura, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

Filed Nov. 4, 1994, Ser. No. 335,976

Claims priority, application Japan, Nov. 8, 1993, 5-059839 U

Int. Cl.[6] H01R *13/627*

U.S. Cl. 439—352 **4 Claims**



1. A connector housing comprising:

a first connector housing and a second connector housing capable of being fitted to each other;

a lock mechanism for fixing said first and second connector housings in a fitted state, said lock mechanism including a locking arm provided on said first connector housing and having a free end portion extending in a direction of fitting of said first and second connector housings and an engagement

member, said lock mechanism also including a lock member capable of receiving and engaging with said locking arm;

disengagement means for disengaging said lock mechanism, said disengagement means including an operating lever extending from said locking arm in a direction opposite to the direction toward the free end portion of said locking arm, said operating lever being capable of moving outward and generally perpendicularly to the direction of fitting of said first and second connector housings to cause a swinging motion of said locking arm such that said locking arm and said lock member are disengaged from each other; and

a frame member in which said locking arm can be inserted, said frame member is provided on said second connector housing, and said frame member contacts said locking arm at its inner end during the outward motion of said operating lever to form a fulcrum of the swinging motion of said locking arm.

5,487,679

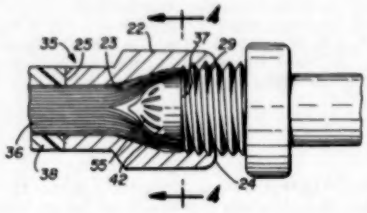
ELECTRIC CONNECTOR

Laythol W. Quaintance, HCl 4415, Pima, Ariz. 85543

Filed May 23, 1994, Ser. No. 247,600

Int. Cl.[6] H01R *4/24*

U.S. Cl. 439—428 **7 Claims**



1. An electric connector comprising:

a female connector member having a central throughbore with a smaller straight bore section of substantially uniform diameter defining a smaller inner surface and an enlarged bore section gradually enlarging away from said straight bore section defining a generally tapered inner contact surface,

an electric conductor having a bundle of electrically conductive strands extending through said throughbore and terminating in an end in said enlarged bore section,

a male connector member having a tapered outer contact surface converging toward and terminating in a pointed end and extending into said conductor end to flare said strands at said end,

said female and male connector members having interfitting connecting means to releasably connect said male connector member to said female connector member and grip said strands between said inner and outer contact surfaces to form an electric connection between said male connector and said conductor,

said outer contact surface being provided by a malleable material having a hardness less than the hardness of said strands and said strands are pressed into said outer contact surface to form depressions in said malleable material for increased contact surface area between said strands and male connector member.

5,487,680

METHOD AND STRUCTURE FOR FIXING A CONNECTOR TO A VEHICLE BODY PANEL

Makoto Yamanashi, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

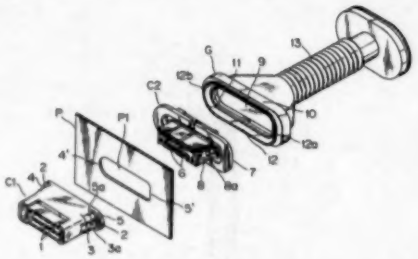
Continuation of Ser. No. 144,570, Nov. 2, 1993, abandoned.

This application Jun. 7, 1995, Ser. No. 485,797

Claims priority, application Japan, Nov. 4, 1992, 4-294975

Int. Cl.[6] H01R *13/73*

U.S. Cl. 439—552 **5 Claims**



2. A structure for coupling two mating connectors for use in vehicles, wherein said structure comprises:

a first connector attached to a vehicle body side wire harness;

a second connector attached to a door side wire harness, and having a locking mechanism at one lateral side; and

a panel provided to the vehicle body for fixing said first connector to a connector fixing hole formed therein, wherein said first connector further comprises:

a pair of first and second fitting flanges formed to protrude from opposite lateral ends of the front portion, the respective adjacent portions to rear surface sides of said first and second fitting flanges having different shapes so as to allow said first connector to be fitted to said fixing hole in only one orientation, and

a pair of resilient locking pieces respectively disposed behind said fitting flanges to be fitted with the inner surface of said panel;

wherein the relationship among the lengths of the longitudinal side l1, the lateral side l2, and the depth l3 of the first connector C1, and the length of the longitudinal side l1', and the lateral side l2' of said connector fixing hole P1 will be l1>l1', l2'>l2, and l1'>l3.

5,487,681

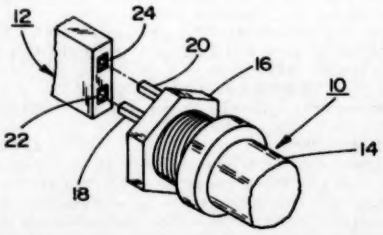
PIN BNC COAXIAL CABLE CONNECTOR RECEPTACLE

Albert A. Star, Dix Hills, and Anthony T. Carbone, Port Jefferson Station, both of N.Y., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Aug. 25, 1994, Ser. No. 296,024

Int. Cl.[6] H01R *9/07*

U.S. Cl. 439—581 **14 Claims**



1. A pin BNC coaxial cable connector which is adapted for direct interconnection with a mono-signal socket connector having

first and second socket terminals; said BNC coaxial cable connector comprising a receptacle body; a first contact post member and a second contact post member each respectively having a square transverse cross-sectional configuration and each projecting from an end of said receptacle body, said second contact post member extending in parallel spaced relationship with said first contact post member to enable conductive reception of said first and second contact post members in, respectively, the first and second socket terminals of the mono-signal socket connector; said first contact post member comprising a center pin projecting from the receptacle body; a ground ring on said receptacle body, said second contact post member being a pin projecting from and conductively fastened to said ground ring.

5,487,682

SHIELDED DATA CONNECTOR

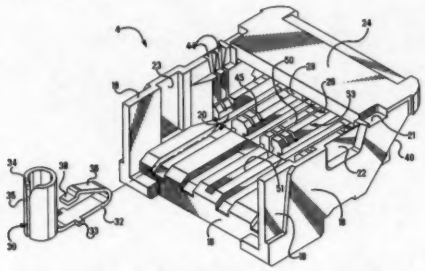
Mitchell E. Miller, Clemmons; Julian J. Ferry, Kernersville, both of N.C.; Brian E. Kilbey, Chesham, England; Bruce S. Coolbear, East Barnet, England, and Richard F. Gandy, St. Albans, England, assignors to The Whitaker Corporation, Wilmington, Del.

Continuation of Ser. No. 101,529, Aug. 3, 1993, abandoned, which is a continuation-in-part of Ser. No. 941,526, Sep. 8, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 479,250

Claims priority, application United Kingdom, Nov. 3, 1992, 9222960; Dec. 29, 1992, 9227064; Feb. 22, 1993, 9303502

Int. Cl.[6] H01R *13/648*

U.S. Cl. 439—607 **24 Claims**



1. A shielded electrical connector comprising

an insulative housing member having a terminal support platform having an open upper face;

a plurality of electrical contacts positioned along said platform, laterally positioned therealong;

said terminal support platform including a longitudinally extending rib upstanding from said platform and positioned between at least two of said contacts;

said rib including a longitudinally extending slot therein; and

a cross talk shield positioned within said slot and within said rib intermediate said two contacts.

5,487,683

SNAP-ON COVER FOR TELECOMMUNICATIONS CONNECTOR BLOCK

Robert C. Carlson, Jr., Torrington, Conn., assignor to The Siemon Company, Watertown, Conn.

Filed Jan. 21, 1994, Ser. No. 184,544

Int. Cl.[6] H01R *9/22*

U.S. Cl. 439—718 **7 Claims**

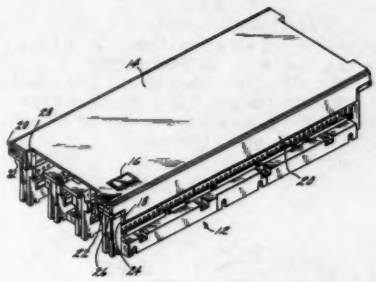
1. A cover for a terminal block comprising:

a planar cover having opposed first and second ends and opposed first and second longitudinal sides;

a first sidewall depending downwardly from a first longitudinal side and a second sidewall depending downwardly from a second longitudinal side, each of said sidewalls including two opposed outer corners;

a cut-out in each of said corners;

resilient latch means depending downwardly from said planar cover at each of said opposed first and second ends, said latch means being disposed inwardly from, and in spaced alignment with a pair of said cut-outs, whereby, said cover is snap lockable to said terminal block by said resilient latch means engageable with platforms of said terminal block.



5,487,684

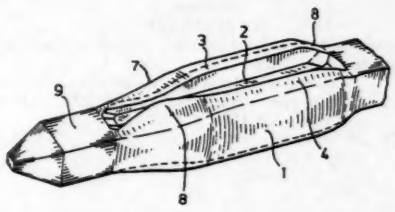
ELECTRICAL CONTACT PIN FOR PRINTED CIRCUIT BOARD

Petrus W. H. Schalk, Drunen, and Paulus J. M. Pigmans, Tilburg, both of, Netherlands, assignors to Berg Technology, Inc., Reno, Nev.

Continuation of Ser. No. 192,769, Feb. 7, 1994, abandoned, which is a continuation of Ser. No. 954,127, Jul. 1, 1992, abandoned. This application Dec. 14, 1994, Ser. No. 357,058

Int. Cl.[6] H01R *13/42*

U.S. Cl. 439—715 **3 Claims**



1. An electrical contact pin for insertion into a through hole in a printed circuit board, said through hole having inner walls, said electrical contact pin having a longitudinal axis, said electrical contact pin comprising:

an insertion portion for guiding said electrical contact pin into said through hole;

a cross rib integrally formed with said insertion portion, said cross rib defining longitudinal surfaces along said longitudinal axis;

fin-like contacts extending from said longitudinal surfaces towards distal ends, each of said fin-like contacts having a contact surface and a curved portion, wherein each of said curved portions extends a distance along the entire length as well as a substantial portion beginning from said longitudinal surfaces towards said distal ends of said fin-like contacts and is curved inwardly towards the center of said longitudinal surfaces; and

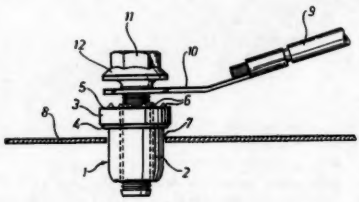
a guiding portion comprised of a leading portion of each of said fin-like contacts, said guiding portion having a guiding surface which is curved to define a gradual curvature.

5,487,685

ELECTRICAL CONTRACT NUT

Ola Stillbäck, Hisings Backa, and Lars Lindahl, Onsala, both of, Sweden, assignors to AB Volvo, Sweden

Continuation of Ser. No. 170,244, Dec. 27, 1993, abandoned.
This application Jun. 7, 1995, Ser. No. 481,921
Claims priority, application Sweden, Jun. 28, 1991, 9102006
Int. Cl.[6] H01R *4/30*
U.S. Cl. 439—801 **2 Claims**



1. An electrical contact nut intended to be welded to a sheet metal component, said nut comprising:

a first cylindrical portion, and

a second cylindrical portion having a larger width dimension than said first cylindrical portion, such that said second cylindrical portion extends beyond said first cylindrical portion in a radial direction; said second cylindrical portion comprising:

a transverse side facing said first cylindrical portion, said transverse side being provided with an annular region of weldable material, and

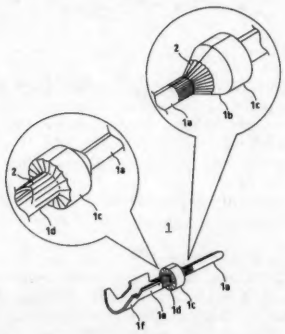
a front side facing opposite to said transverse side, said front side being provided with means for increasing friction between said nut and a component which is intended to be mounted on said front side whereby, co-rotation of said component relative to said nut is substantially reduced.

5,487,686

PIN TERMINAL

Yoshitsugu Sawada, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Jun. 9, 1994, Ser. No. 257,829
Claims priority, application Japan, Jun. 10, 1993, 5-163815
Int. Cl.[6] H01R *4/02*
U.S. Cl. 439—884 **3 Claims**



1. A pin terminal comprising:

an electrical connection portion;

a body portion continuously provided with the electrical connection portion;

an interconnecting portion continuously provided with the body portion;

a wire connection portion continuously provided with the interconnecting portion; and

corrugated configuration portions circumferentially provided at least one of between the body portion and the electrical connection portion and between the body portion and the interconnecting portion, respectively,

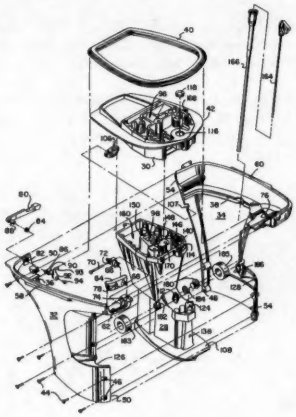
wherein the body portion has a cylindrical shape larger in diameter than the electrical connection portion and the interconnecting portion.

5,487,687

MIDSECTION AND COWL ASSEMBLY FOR AN OUTBOARD MARINE DRIVE

George D. Idzikowski, Oshkosh; Wayne M. Jaszewski, Jackson, and George E. Phillips, Oshkosh, all of Wis., assignors to Brunswick Corporation, Lake Forest, Ill.

Filed Jul. 18, 1994, Ser. No. 276,477
Int. Cl.[6] B63H *21/00*
U.S. Cl. 440—77 **26 Claims**



1. An outboard marine drive comprising:

a power head;

an upper cowl assembly enclosing the power head;

a lower gear case drivingly connected to the power head;

a midsection housing disposed between the power head and the lower gear case; and

a midsection cowl assembly comprising a first cowl section and a second cowl section, wherein the first and second cowl sections adapt to fit together for enclosing at least a majority of the midsection housing and wherein the first and second cowl sections have edge portions which cooperate to form a joint between the cowl sections when the cowl sections are assembled together about the marine drive midsection housing.

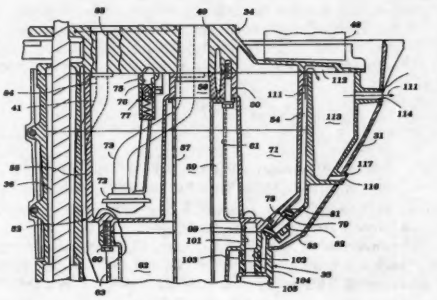
5,487,688

OUTBOARD MOTOR

Yukio Sumigawa, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushika Kaisha, Hamamatsu, Japan

Filed Sep. 8, 1994, Ser. No. 302,593
Claims priority, application Japan, Sep. 8, 1993, 5-247582
Int. Cl.[6] B63H *21/38*
U.S. Cl. 440—88 **28 Claims**

1. An outboard motor comprised of a power head containing an internal combustion engine having an exhaust discharge for discharging exhaust gases from said engine, a drive shaft housing depending from said power head and containing a propulsion



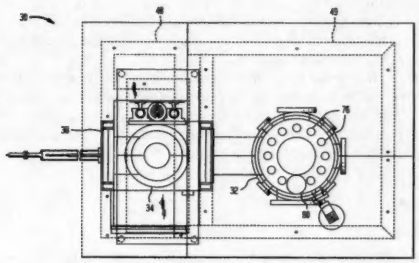
device driven by said engine for propelling an associated watercraft, an oil tank for supplying lubricant to said engine depending into said drive shaft housing, a cooling jacket extending along at least one external wall of said oil tank, and means for circulating water through said cooling jacket for cooling said oil tank and the lubricant contained therein, said cooling jacket being defined by an upstanding wall, the upper edge of a portion of which forms a weir and wherein said means for circulating water delivers water to said cooling jacket and the level of coolant being maintained by said weir.

5,487,689

HIGH THROUGHPUT ASSEMBLY STATION AND METHOD FOR IMAGE INTENSIFIER TUBES

Richard F. Floryan, Roanoke, Va., and David D. Frisch, Fort Wayne, Ind., assignors to ITT Corporation, New York, N.Y.

Filed Aug. 15, 1994, Ser. No. 290,380
Int. Cl.[6] H01J *9/24;9/38;9/48*
U.S. Cl. 445—29 **20 Claims**



14. A method of assembling photocathodes into vacuum tube housing, comprising the steps of:

loading a plurality of photocathodes into a first chamber;

loading a plurality of vacuum tube housing into a second chamber, each of said vacuum tube housing including a protective cap;

evacuating said first chamber and said second chamber as a common vessel;

processing said photocathodes within said first chamber;

removing said protective cap from each one of said plurality of vacuum tube housings;

processing said vacuum tube housings within said second chamber;

automatically transferring individual ones of said photocathodes from said first chamber to said second chamber; and

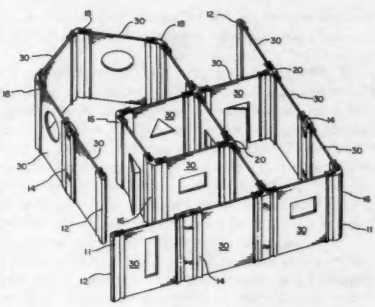
assembling photocathodes to said vacuum tube housings in said second chamber, thereby forming a plurality of vacuum tube assemblies.

5,487,690

CLAMPS FOR MAKING CORRUGATED PANEL FREE STANDING PLAY STRUCTURES

Thomas N. Stoffle, and Linda M. Stoffle, both of W6037 County B, Peshtigo, Wis. 54157

Filed Jan. 24, 1994, Ser. No. 185,038
Int. Cl.[6] A63H *33/10*
U.S. Cl. 446—105 **6 Claims**



1. A clamp, in combination with corrugated panels, for connecting corrugated panels, to make a free standing play structure, comprising, in operative combination:

corrugated panels having length, width, thickness, and crush strength, to be retained by said clamp;

a flexible, plastic, one piece longitudinal extrusion, comprising in cross section;

a web;

a pair of clamp legs, said clamp legs projecting from said web;

said clamp legs forming a U-shaped panel receiving opening, extending lengthwise of said extrusion;

panel insertion guide means, formed by each pair of said clamp legs, including flared tips of each pair of said clamp legs that are wider apart than the thickness of said corrugated panel to be clamped, for supporting said panel and guiding said panel into the clamp;

panel elastic deformation means formed by opposing radii, each radius, formed in a flexible section of each clamp leg, said radii applying a force less than the crush strength of said panel, to the corrugated panel held between said pair of clamp legs, whereby said corrugated panel, forced between the legs, is elastically deformed in order to retain said panel within the legs;

panel crush deformation means, formed by an opposed pinch point projection, formed in each clamp leg, the width between opposed pinch points, less than the width of said corrugated panel to be clamped, said clamp legs applying a force greater than the crush strength of said panel, at the pinch point without piercing the cardboard whereby said corrugated panel forced between the clamp legs is crush deformed, to retain the panel within the legs.

5,487,691

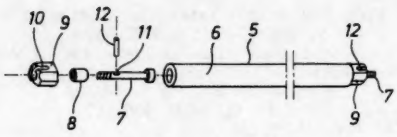
SPHERE AND ROD CONSTRUCTION TOY

Frank T. S. Chiu, Tuen Mun, Hong Kong, assignor to Yip Tai Toys Industrial Ltd., Tuen Mun, Hong Kong

Filed Mar. 16, 1994, Ser. No. 213,699
Claims priority, application China, Jan. 3, 1994, 94200035.8
Int. Cl.[6] A63H *33/12*
U.S. Cl. 446—126 **5 Claims**

1. A sphere and rod construction toy comprising generally spherical construction members and rod members for connecting said spherical construction members whereby:

said generally spherical construction members are hollow having five threaded openings provided at both the upper and lower hemispheres thereof and having four to eight threaded



openings provided along the equator thereof; the axis of each threaded opening passes through the center of the spherical member; and

said rod members are extensible and contractible;

and wherein said extensible and contractible rod members comprise a hollow rod member, each end of which having a ring member being secured within an inner wall thereof, a screw slidably received in said ring member with its threaded portion extending out the end of said hollow rod member, an orientation pin being fixedly received in a transverse opening on said screw, and a screw fastening sleeve member slidably connected along said screw between said ring member and said orientation pin, said screw fastening sleeve member having orientation slots for receiving therein the ends of said orientation pin, whereby said rod members can be connected to said generally spherical construction members by wrenching said screw fastening sleeve member with a wrench thereby screwing said screw into a said threaded opening.

5,487,692

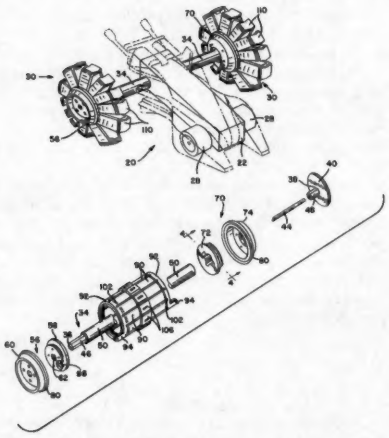
EXPANDABLE WHEEL ASSEMBLY

Kevin B. Mowrer, Loveland, and Robert L. Beck, Cincinnati, both of Ohio, assignors to Tonka Corporation, Pawtucket, R.I.

Filed Sep. 30, 1994, Ser. No. 315,718

Int. Cl.[6] A63H *17/00*

U.S. Cl. 446—465 **25 Claims**



1. A wheel assembly for use with a toy vehicle comprising:

an axle having a first end and a second end;

a first hub fixed to the axle proximate the first end;

a second hub supported by the axle and movable between the second end of the axle and the first hub, the second hub including a plurality of inwardly directed and substantially triangular-shaped points having means for maintaining coaxial alignment of the second hub and the axle; and

a plurality of webs spanning between and joined to the first hub and the second hub and each web having a central portion; and

wherein the axle, the first hub, the second and movable hub, and the webs are included in means for moving the central portions of the webs outward from the axle in response to centrifugal force induced by rotation of the wheel assembly.

5,487,693

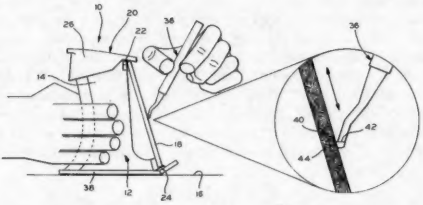
SHARPENING DEVICE AND METHOD FOR SHARPENING A DENTAL INSTRUMENT

John H. Prusaitis, and Timothy J. Prusaitis, both of c/o 5706 Northwest Hwy., Chicago, Ill. 60646

Continuation of Ser. No. 6,137, Jan. 19, 1993, abandoned, which is a continuation of Ser. No. 826,139, Jan. 27, 1992, abandoned. This application Aug. 31, 1994, Ser. No. 299,250

Int. Cl.[6] B24D *15/06*

U.S. Cl. 451—45 **5 Claims**



1. A method of sharpening a dental instrument having a handle and a tip formed to have a cutting edge defined by a face and lateral side, comprising the steps of:

providing base means supporting a sharpening stone in a fixed position and placing said base means on a horizontal surface to cause said sharpening stone to be fixed at a preselected angle to said horizontal surface;

holding said handle of said dental instrument with one hand and holding said base means with the other hand;

placing said lateral side of said tip of said dental instrument into direct contact with said sharpening stone;

orienting said tip of said dental instrument such that said face is disposed parallel to said horizontal surface and in a horizontal plane without regard to the angle of said handle relative to said sharpening stone; and

thereafter imparting relative movement between said tip of said dental instrument and said sharpening stone while maintaining said face parallel to said horizontal surface and in a horizontal plane without regard to the angle of said handle relative to said sharpening stone.

5,487,694

METHOD FOR SHAPING HONEYCOMB SUBSTRATES

Scott W. Deming, Elmira, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Nov. 12, 1993, Ser. No. 151,107

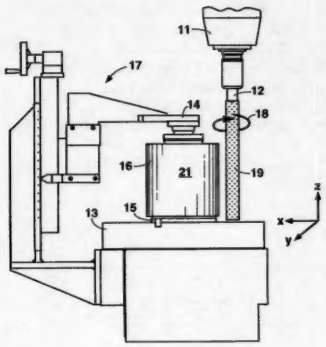
Int. Cl.[6] B24B *19/08*

U.S. Cl. 451—49 **5 Claims**

1. A method for producing a honeycomb body having a side surface bounded by a closed cylinder of a selected circumference and curvature which comprises the steps of:

providing an extruded honeycomb body having a selected length and having a side surface bounded by a closed cylinder of a circumference larger than the selected circumference; and

removing material from the side surface to reduce the circumference thereof at least to the selected circumference, wherein the step of removing material comprises abrasively removing material from the side surface with a rotating abrasive means having a length at least equal to the selected length and an axis of rotation parallel to the side surface, the rotating abrasive means being attached to a spindle means which allows the abrasive means to move in a plane perpendicular to the axis of rotation.



5,487,695

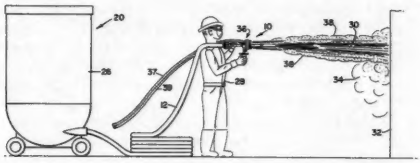
BLAST NOZZLE COMBINED WITH MULTIPLE TIP WATER ATOMIZER

James D. Shank, Vestal, N.Y., assignor to Church & Dwight Co., Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 958,552, Oct. 8, 1992, Pat. No. 5,319,894. This application Dec. 17, 1993, Ser. No. 169,774

Int. Cl.[6] B24C *5/04*

U.S. Cl. 451—102 **20 Claims**



1. A blast nozzle and water atomizer combination for directing a stream of abrasive particles against a targeted surface for the removal of surface contaminants therefrom and for reducing dust formation comprising: a blast nozzle including a means to accelerate a mass of abrasive particles from the inlet of said blast nozzle to the outlet thereof and a means to atomize water with air attached to the exterior of said blast nozzle, said means to atomize water comprising multiple atomization nozzles spaced around the exterior of said blast nozzle, each atomization nozzle including means to mix separate streams of water and air and including outlet means separate from said blast nozzle outlet and positioned to direct said atomized water to a location adjacent said targeted surface without substantially interfering with said mass of abrasive particles as said abrasive particles are directed from the outlet of said blast nozzle to said targeted surface.

5,487,696

APPARATUS FOR POLISHING MEDALS FOR GAME MACHINE AND FOR SEPARATING ABRASIVE THEREFROM

Takatoshi Takemoto; Masayoshi Yoshikawa, both of Tokyo; Moriyuki Aoyama, Okazaki; Meiji Muramatsu, Yokohama, and Kazunari Kawashima, Tokyo, all of, Japan, assignors to Kabushiki Kaisha Ace Denken, Tokyo, Japan

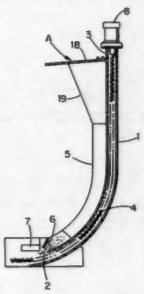
PCT No. PCT/JP91/01432, § 371 Date Nov. 15, 1993, § 102(e) Date Nov. 15, 1993, PCT Pub. No. WO92/17316, PCT Pub. Date Oct. 15, 1992

PCT Filed Oct. 18, 1991, Ser. No. 119,246

Claims priority, application Japan, Mar. 26, 1991, 3-061707; Aug. 27, 1991, 3-215619

Int. Cl.[6] B24B *31/073*

U.S. Cl. 451—105 **20 Claims**



1. An apparatus for polishing medals for a game machine and for separating an abrasive from the medals, including: a polishing pipe **1** which is disposed upright for lifting a mixture of the medals and the abrasive supplied thereto while stirring the mixture so as to polish the medals; and a separation unit A which is disposed at an upper portion of said polishing pipe **1** for separating said abrasive from the mixture of said medals and abrasive delivered from said polishing pipe **1**, and re-feeding said abrasive into said polishing pipe **1**; said polishing pipe **1** having an intake port **2** for receiving said medals and said abrasive supplied thereto, at a lower portion side thereof, a medal delivery port **3** at an upper end portion thereof, and a rotatable screw element **4** which lifts up said medals and said abrasive while stirring them together, which is characterized in:

that said separation unit A is provided with a return pipe **5** for returning the separated abrasive to said intake port; and

that said return pipe **5** is provided with a flap which is movable toward said intake port **2** by a weight of said abrasive, at a lower portion thereof which communicates with said intake port **2**.

5,487,697

POLISHING APPARATUS AND METHOD USING A ROTARY WORK HOLDER TRAVELLING DOWN A RAIL FOR POLISHING A WORKPIECE WITH LINEAR PADS

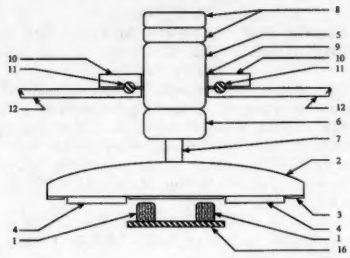
Elmer W. Jensen, New Castle, Del., assignor to Rodel, Inc., Newark, Del.

Filed Feb. 9, 1993, Ser. No. 15,609

Int. Cl.[6] B24B *7/00*

U.S. Cl. 451—324 **20 Claims**

1. An apparatus for polishing a flat surface comprising: (a) one or more linear polishing pads each of which has a long linear dimension such that the surface of each pad which contacts said workpiece is long and narrow; and (b) a carrier which holds at least one workpiece to be polished, said carrier mounted to a rail which is parallel to a longitudinal axis of said linear polishing pad or pads whereby said carrier periodically passes each workpiece over a different portion of said pad surface as said carrier travels along said rail generally in a straight line parallel to said long linear



dimension of said linear polishing pad or pads down the length of said linear polishing pad or pads.

5,487,698

STUNNING APPARATUS

Peter J. Kettlewell, Marston Mortaine; Mark E. R. Paice, Hitchen; William C. Whetlor, Kempston, and Julian M. Sparrey, Silsoe, all of, England, assignors to British Technology Group Ltd., London, United Kingdom

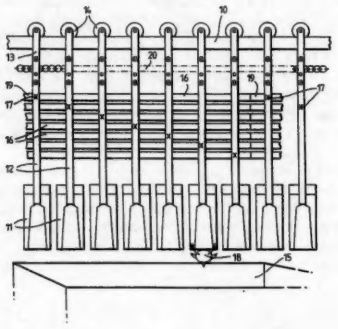
PCT No. PCT/GB92/01872, § 371 Date Apr. 12, 1994, § 102(e) Date Apr. 12, 1994, PCT Pub. No. WO/9307757, PCT Pub. Date Apr. 29, 1993

PCT Filed Oct. 13, 1992, Ser. No. 211,679

Claims priority, application United Kingdom, Jan. 18, 1991, 9122142

Int. Cl.[6] A22B *3/06*

U.S. Cl. 452—58 **13 Claims**



1. An apparatus for passing an electrical current through each of a series of items of varying electrical resistance, including

a continuous shackle train having shackles evenly spaced along its length,

a water bath,

electrical circuitry having a connection to the bath,

means for connecting the circuitry to the shackles, where any item bridging a shackle and the water bath completes an individual electrical circuit and causes a predetermined current to pass through each item, and

means for controlling the predetermined current to maintain the predetermined current for a predetermined time, the predetermined current being the same for each item regardless of the electrical resistance of each of the items.

5,487,699

TREATMENT OF POULTRY

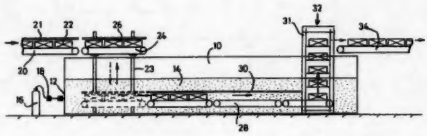
Christopher M. Tyrrell, Bungay; David R. Wills, Roydon; David V. Gardiner, Starston, and Barry W. Landymore, Brockdish, all of, United Kingdom, assignors to Anglia Autoflow Limited, Diss, United Kingdom

Filed Nov. 30, 1994, Ser. No. 346,786

Claims priority, application United Kingdom, Jan. 27, 1994, 9401520

Int. Cl.[6] A22B *3/00*

U.S. Cl. 452—66 **8 Claims**



1. Apparatus for gas stunning of poultry, the apparatus comprising:

a plurality of containers each in the form of an open-topped rectangular drawer which is moulded from a synthetic plastics material with apertures to allow the passage of stunning gas into the containers,

a chamber accommodating a heavier than air gas or gases effective to stun the poultry,

an infeed conveyor for delivering a series of said containers, each containing poultry, to an inlet end of the chamber,

a covering panel spaced above the infeed conveyor by a distance which allows the passage of the containers on the infeed conveyor and which covers the tops of the containers in a manner to prevent the poultry in the containers escaping therefrom,

lowering means for accepting the containers delivered by the infeed conveyor and for lowering the containers into the chamber, the lowering means including a cover which is positioned so as to cover the open tops of the containers while on the lowering means and thereby prevent poultry escaping from the containers while on the lowering means,

conveyor means within the chamber for accepting the containers from the lowering means and for transporting the containers through the chamber,

covering means above the conveying means, the covering means being spaced above the conveying means by a distance which allows the passage of the containers on the conveyor means and which covers the tops of the containers to prevent the poultry in the containers escaping therefrom, the covering means being of apertured construction to permit the passage of gas therethrough, so that the gas enters the containers and air leaves the containers through the apertures in the containers and through the covering means,

lifting means for receiving the containers at an outfeed end of the conveyor means and lifting the containers out of the chamber,

and an outfeed conveyor for accepting containers with stunned poultry and for transporting the containers with stunned poultry away from the chamber.

5,487,700

POULTRY SHACKLE WITH ROTATABLE STIRRUPS

Kenneth D. Dillard, Canton, Ga., assignor to Dapec, Inc., Canton, Ga.

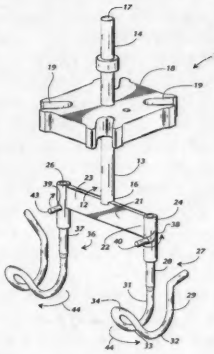
Filed Jun. 6, 1995, Ser. No. 498,980

Int. Cl.[6] A22C *21/00*

U.S. Cl. 452—188 **12 Claims**

1. A poultry support shackle assembly for transporting a poultry carcass along the overhead conveyer system of a poultry processing line, said shackle assembly comprising:

a support frame adapted to be coupled to the overhead conveyor system;



a pair of spaced apart stirrup members depending from said support frame with each of said stirrup members being adapted to receive and releasably hold a corresponding hock of the poultry carcass to suspend the carcass by its hocks and legs from the stirrup members;

mounting means for mounting at least one of said stirrup members to said support frame for rotation about a substantially vertical axis extending along said at least one stirrup member so that the poultry hock and leg suspended from said stirrup member are free to rotate to accommodate rotation and spreading of the legs of the poultry carcass that occurs during processing of the carcass.

5,487,701

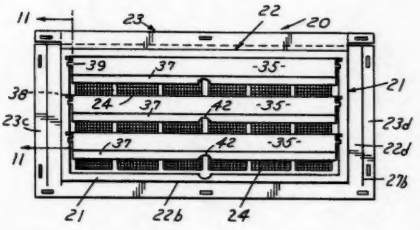
PLASTIC FOUNDATION VENT

Charles E. Schidegger, Metamora; Clyde G. Allen, North Branch; Michael C. Clark, Columbiavilla; Aundrea Nurenberg, and Jack Wnuk, both of Lapeer, all of Mich., assignors to Mid-America Building Products Corporation, Plymouth, Mich.

Filed Jun. 20, 1994, Ser. No. 262,237

Int. Cl.[6] F24F *13/08*

U.S. Cl. 454—271 **10 Claims**



1. A plastic foundation vent comprising

a plastic body with an integral peripheral rectangular wall surrounding the plastic body and defining opposed long sides and opposed short sides,

an integral peripheral flange extending outwardly from the peripheral wall,

a central integral screen portion having openings,

said peripheral flange having a front surface and a rear surface,

a first groove provided on the rear surface of the top flange to define a live hinge line permitting the flange to be bent backwardly and forwardly,

a second groove on the front surface of the flange on each of the short sides to permit bending of the flange along the short sides.

5,487,702

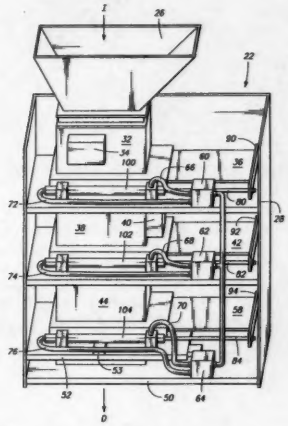
GRAIN WEIGHING AND MEASURING SYSTEM

Ronald Campbell, Mendon, Utah; Gaylon Campbell, Pullman, Wash., and Craig Christensen, Logan, Utah, assignors to HarvestMaster, Inc., Logan, Utah

Filed Jul. 6, 1994, Ser. No. 272,238

Int. Cl.[6] A01F *12/50*

U.S. Cl. 460—7 **27 Claims**



1. A weighing and measuring apparatus for continuously measuring sub-samples of a grain plot during harvesting, comprising:

an enclosure;

an inlet controllably directing a continuous flow of grain into the enclosure;

volume sizing means mounted within the enclosure for separating a known volume sub-sample of grain from the continuous flow of grain into the enclosure;

moisture measuring means mounted within the enclosure for detecting the moisture content of the grain sub-sample;

weigh means mounted within the enclosure for weighing the grain sub-sample;

a reference measurement means positioned adjacent the weigh means inside the enclosure for determining external forces acting on the grain sub-sample during weighing and measuring; and

an outlet for directing the grain sub-sample from the enclosure and into a grain storage tank of a grain harvester.

5,487,703

STRAW WALKER FOR CHAFF REMOVAL IN A COMBINE

George J. Kuchar, P.O. Box 595, Carlinville, Ill. 62626

Filed Feb. 8, 1994, Ser. No. 193,266

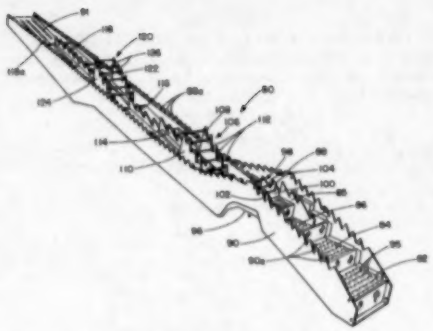
Int. Cl.[6] A01F *12/32*

U.S. Cl. 460—85 **20 Claims**

1. Apparatus for use in a combine for receiving a mixture of grain and chaff, wherein said apparatus is displaced so as to agitate the mixture of grain and chaff for separating the grain from the chaff, said apparatus comprising:

an elongated, generally linear, flat bottom panel having a plurality of spaced apertures therein for supporting the chaff while permitting transit of the grain through said apertures during agitation of the grain and chaff mixture;

first and second side panels attached to respective, opposed lateral edges of said bottom panel, said first and second side panels respectively including first and second sets of teeth arranged in a spaced manner on a respective upper edge of the side panel along the length thereof for engaging and moving the mixture of grain and chaff in a rearward direction at a first



speed, wherein the spacing between adjacent teeth in the first and second sets of teeth is D_1; and

a first inner panel, mounted to an upper surface of said bottom panel intermediate said first and second side panels and having a third set of teeth disposed in a spaced manner on an upper edge and along the length thereof for engaging and moving the mixture of grain and chaff in a rearward direction at a second speed, wherein the spacing between adjacent teeth in said third set of teeth is D_2, where $D_2 > D_1$ and said second speed is greater than said first speed.

5,487,704

APPARATUS FOR DAMPING VIBRATIONS

Oswald Friedmann, Lichtenau, and Johann Jäckel, Bühl, both of, Germany, assignors to LUK Lamellen und Kupplungsbau GmbH, Bühl, Germany

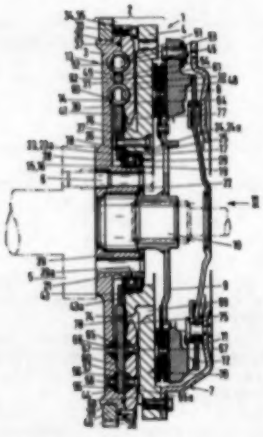
Continuation of Ser. No. 626,384, Dec. 12, 1990, abandoned, which is a continuation of Ser. No. 434,524, Nov. 7, 1989, abandoned, which is a continuation of Ser. No. 63,301, Jun. 17, 1987, abandoned. This application May 7, 1993, Ser. No. 60,490

Claims priority, application Germany, Jul. 5, 1986, 36 22 697.1; Jan. 4, 1986, 36 33 870.2; Dec. 13, 1986, 36 42 679.2

The portion of the term of this patent subsequent to Mar. 16, 2010, has been disclaimed.

Int. Cl.[6] F16D *3/14*

U.S. Cl. 464—24 **44 Claims**



1. Apparatus for damping vibrations between an engine and a clutch in a power train, comprising a first flywheel connectable with the engine; a second flywheel rotatable relative to the first flywheel and having a friction surface enagageable with a clutch plate of the clutch; at least one damper device including an input component constituted by said first flywheel, an output component constituted by said second flywheel, a chamber including a radially outer portion constituting a compartment, a supply of viscous medium which at least partially fills said compartment, a plurality of energy storing elements which are disposed and supported in said compartment, said chamber having internal surfaces bounding said compartment and including radially outer portions positioned at the path of radially outward movements of the energy storing elements under the action of centrifugal force when said flywheels rotate to thus produce a frictional damping action between said flywheels, said flywheels being rotatable relative to each other against the resistance of said energy storing elements, said energy storing elements and said at least one damper device further having means for deforming said energy storing elements, said deforming means including at least one first abutment provided on said chamber and located in said compartment and a flange rotatable with one of said flywheels and having at least one second abutment in said compartment, said energy storing elements jointly extending along an arc which approximates between 70 and 96 percent of a complete circle; and wear reducing means contacting said supply of viscous medium and being positioned in the path of radially outward movement of said energy storing elements under the action of centrifugal force in response to rotation of said flywheels to intercept said energy storing elements and to at least reduce the wear by said energy storing elements upon the radially outer portions of said internal surfaces during rotation of said flywheels.

5,487,705

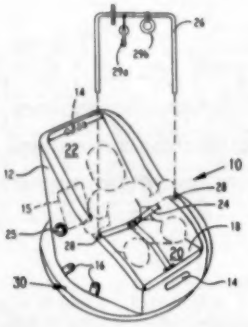
BABY CAROUSEL

William A. Clarke, 4549 Budd Dr., Erie, Pa. 16506

Filed Sep. 23, 1993, Ser. No. 126,040

Int. Cl.[6] A63G *1/10*

U.S. Cl. 472—29 **19 Claims**



1. An entirely portable infant entertainment device comprising:

a) a stationary base;

b) a seat member rotationally attached to said base for receiving an infant in a semi-reclined position;

c) a drive element for rotating said seat member relative to said base member to entertain said infant;

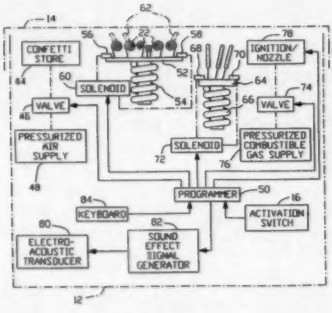
d) means for supplying power to said drive element; and,

e) means for playing music when said seat member is activated.

5,487,706
ENTERTAINMENT SYSTEM AND ASSOCIATED METHOD

Peter J. Wilk, 185 W. End Avenue, New York, N.Y. 10023

Continuation-in-part of Ser. No. 943,392, Sep. 10, 1992, Pat. No. 5,304,096. This application Apr. 1, 1994, Ser. No. 221,481
The portion of the term of this patent subsequent to Apr. 19, 2011, has been disclaimed.
Int. Cl.[6] A63H *13/16*
U.S. Cl. 472—54 **24 Claims**



1. An entertainment system comprising:

a housing;

first ejection means in said housing for ejecting a first entertainment device from said housing;

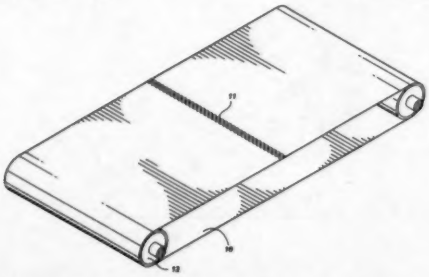
second ejection means in said housing for ejecting a second entertainment device from said housing, said second entertainment device being different from said first entertainment device, one of said first entertainment device and said second entertainment device including a pair of balloons interconnected by and supporting a banner with a message; and

control means operatively connected to said first ejection means and said second ejection means for operating said second ejection means a predetermined interval after operating said first ejection means to produce a three-dimensional entertainment display which varies over a significantly extended time period.

5,487,707
PUZZLE CUT SEAMED BELT WITH BONDING BETWEEN ADJACENT SURFACES BY UV CURED ADHESIVE

Lucille M. Sharf, Pittsford; Laurence J. Lynd, Macedon; James F. Smith, Walworth, and Edward L. Schlueter, Jr., Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 29, 1994, Ser. No. 297,201
Int. Cl.[6] F16G *1/00*
U.S. Cl. 474—253 **23 Claims**

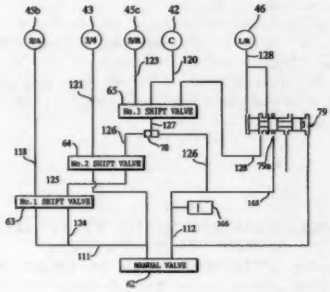


1. An endless, seamed, flexible belt comprising a strip of a flexible material having two ends that are joined to form the endless belt having a substantially uniform thickness and only a single seam, the two ends having a plurality of mutually mating elements in a puzzle cut pattern, the opposite surfaces of the two ends being in an interlocking relationship to prevent separation of the two ends, the surfaces of the mutually mating elements defining voids therebetween to permit the presence of an ultraviolet radiation cured adhesive, the seam including the ultraviolet radiation cured adhesive in the voids between the surfaces of the mutually mating elements, wherein there is absent any substantial thickness differential between the seam and the adjacent interlocking mating elements, wherein the seam extends linearly across the entire width of the belt, and wherein there are absent thermally induced distortions in the belt caused by the curing of the adhesive.

5,487,708
AUTOMATIC TRANSMISSION CONTROL SYSTEM FOR AUTOMOBILES

Toshihisa Marusue, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 16, 1994, Ser. No. 290,637
Claims priority, application Japan, Aug. 17, 1993, 5-203433
Int. Cl.[6] F16H *61/00*
U.S. Cl. 475—116 **5 Claims**



1. An automatic transmission control system including a plurality of frictional coupling elements, provided within an automatic transmission, which are selectively locked and unlocked by supplying and releasing hydraulic pressure so as to place the automatic transmission into any desired gear in various ranges, including at least a low speed range and a reverse range, said frictional coupling elements including a low/reverse frictional coupling element for providing said low speed range and said reverse range, said automatic transmission control system comprising:

a hydraulic pressure circuit for supplying hydraulic pressure to each of said frictional coupling elements from a hydraulic pressure source;

a first shift valve for connecting and disconnecting supply of said hydraulic pressure to said low/reverse frictional coupling element through said hydraulic pressure circuit so as to lock and unlock said low/reverse frictional coupling element in said low speed range and in said reverse range; and

a second shift valve for connecting and disconnecting supply of said hydraulic pressure to one of said frictional coupling elements, which causes mechanical locking of said automatic transmission when said one of said frictional coupling elements is locked simultaneously with locking of said low/reverse frictional coupling element, so as to lock and unlock said one of said frictional coupling elements;

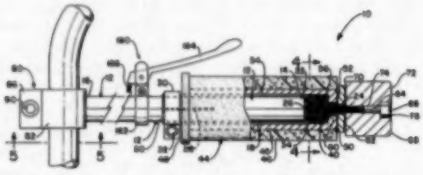
said first shift valve and said second shift valve cooperating with each other so as to connect supply of said hydraulic pressure alternatively to said low/reverse frictional coupling element and said one of said frictional coupling elements.

5,487,709

ADJUSTABLE ROTATING RESISTANCE EXERCISER

Thomas E. Froelich, Sr., 2332 12th St., Cuyahoga Falls, Ohio 44223, and Jeffrey T. Bertka, Cuyahoga Falls, Ohio, assignors to Thomas E. Froelich, Sr., Cuyahoga Falls, Ohio

Filed May 27, 1994, Ser. No. 249,958
Int. Cl.[5] A63B *23/14*
U.S. Cl. 482—46 10 Claims



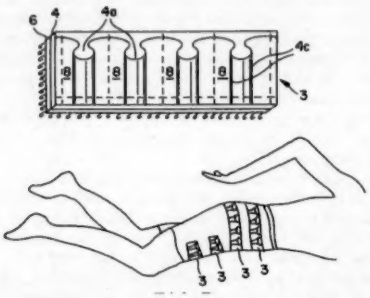
1. An adjustable rotating resistance exerciser, comprising:
a handlebar;
an inner collar disposed around and mounted to at least one end of said handlebar;
an internally threaded square shaft extending axially from said inner collar;
means for generating resistance disposed on said internally threaded square shaft;
a tubular grip handle disposed over said means for generating resistance and said inner collar such that said tubular grip handle rotates around said handlebar; and
means for adjusting said means for generating resistance, wherein said means for adjusting is rotatably mounted to said tubular grip handle.

5,487,710

SWIMMER'S DRAG SUIT HAVING DETACHABLE AND REPOSITIONABLE POCKETS

Blaise Lavorgna, 27735 Pemberton Dr., and Peter R. Sebastian, 27163 Loch Lomond Ct., both of Salisbury, Md. 21801

Filed Mar. 30, 1995, Ser. No. 413,266
Int. Cl.[5] A63B *31/00*
U.S. Cl. 482—55 17 Claims



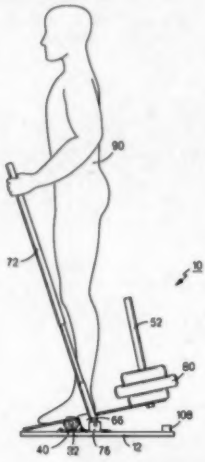
1. A device for training swimmers, said device comprising: a swimsuit; a drag-creating strip comprising material forming at least one cavity having an open end; and fastening means for detachably fastening the drag-creating strip to said swimsuit in any one of a plurality of different orientations, whereby the open end of said at least one cavity is positionable on the swimsuit worn by the swimmer at various orientations relative to the direction of movement of the swimmer through the water.

5,487,711

LOWER LEG EXERCISE DEVICE AND METHOD

Oscar L. Little, P.O. Box 2621, Danbury, Conn. 06813

Filed Nov. 25, 1994, Ser. No. 344,944
Int. Cl.[6] A63B *23/04*
U.S. Cl. 482—79 8 Claims



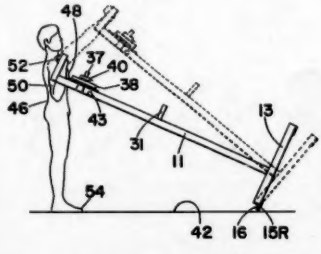
1. A method of exercising lower leg muscles of a person, comprising:
(a) providing a base member to be placed on a horizontal surface;
(b) providing two, elongate, parallel plates attached to rotating means mounted on said base member;
(c) providing support means disposed at distal ends of said plates to accommodate thereon selected weights;
(d) said person standing on said plates, with a foot over each of said rotating means; and
(e) said person moving said weights between a first, lowered position and a second, elevated position by alternatingly flexing and relaxing muscles in said person's lower leg.

5,487,712

METHOD OF EXERCISING USING A PIVOTING EXERCISE APPARATUS

David M. Kann, 609 Cross Ridge Cir. North, Fort Worth, Tex. 76120

Filed Feb. 8, 1994, Ser. No. 193,278
Int. Cl.[6] A63B *21/06*
U.S. Cl. 482—97 9 Claims



1. A method of exercising with an exercise apparatus, comprising the steps of:

providing a vertically oriented frame having first and second ends, where a bar extends across said second end of the frame and said first end is coupled to a base that is located on a floor surface, said base being horizontally oriented;

locating weights directly on said vertically oriented frame;

pivoting said vertically oriented frame and said base so that said frame moves from a vertical orientation to a first non-vertical position and said base moves from a horizontal orientation to a non-horizontal orientation;

moving said frame together with said base by way of said bar so that said frame moves from said first non-vertical position to a second non-vertical position.

5,487,713

AQUATIC EXERCISE AND REHABILITATION DEVICE

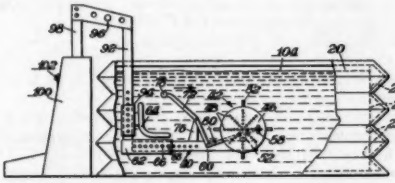
Brian R. Butler, 2727 Hillview Dr., Broomall, Pa. 19008

Continuation-in-part of Ser. No. 105,758, Aug. 12, 1993, Pat. No. 5,316,532. This application May 2, 1994, Ser. No. 236,559

The portion of the term of this patent subsequent to May 31, 2011, has been disclaimed.

Int. Cl.[6] A63B *21/008;22/06*

U.S. Cl. 482—111 **12 Claims**



1. An aquatic exercise and rehabilitation apparatus, comprising an exercise cycle having a frame, a seat, a pedal assembly, a pair of drive shafts and an oscillatable handlebar assembly,

(a) said pedal assembly having two inner and two outer concentrically interconnected discs;

(b) said inner discs being rotatably mounted to an axle which in turn is fixedly mounted to said frame, and said inner discs each being connected to one of said outer discs by bridge means such that rotation of either disc will effect rotation of the other;

(c) said outer discs having crank arms with foot pedals attached thereto; and

(d) said handlebar assembly having two levers pivotally connected to said frame; said levers each being pivotally connected to said drive shafts which are in turn pivotally connected to said bridge means such that operation of either said handlebar assembly or said pedal assembly will effect movement of the other; and

(e) said seat being mounted to a lift assembly for selectively moving a user to a first position outside a treatment vessel and a second position within the treatment vessel whereby said exercise cycle may be adapted for use in the treatment vessel by individuals with unilaterally or bilaterally diminished mobility or range of motion the upper or lower extremities.

5,487,714

EXERCISE MACHINE WITH ENCLOSED RESISTANCE ASSEMBLY

Carlo Ferrari, Alicante, Spain, assignor to Weider Health and Fitness, Inc., Woodland Hills, Calif.

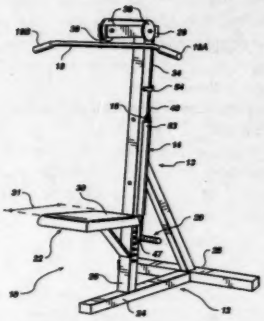
Filed Nov. 19, 1993, Ser. No. 155,008

Int. Cl.[6] A63B *21/02*

U.S. Cl. 482—123 **7 Claims**

1. An exercise machine comprising:

a frame;



a movable element operably associated with said frame for movement relative to said frame by a user in the performance of exercise;

resistance means having a first end and a second end, said second end being connected to said movable element, said resistance means having an elastically deformable element extending between said first end and said second end to resist movement of said movable element;

biasing means adapted to said resistance means proximate said first end for adjustably tensioning said resistance means, said biasing means including a handle for grasping by a user to move said first end relative to said frame, said biasing means having first means for removable connection to said frame;

second means associated with said frame for removably interconnecting said first means and said second means at a selected location of a plurality of locations on said frame to adjust the tensioning of said resistance means; and

enclosure means connected to said frame for substantially enclosing said elastically deformable element, said enclosure means including;

an outer sleeve member attached to said frame with said elastically deformable element substantially therewithin, and

an inner sleeve attached to said resistance means proximate said first and to enclose a portion of said resistance means therewithin, said inner sleeve being sized to telescope into said outer sleeve.

5,487,715

ROLL WITH VIBRATION DAMPER

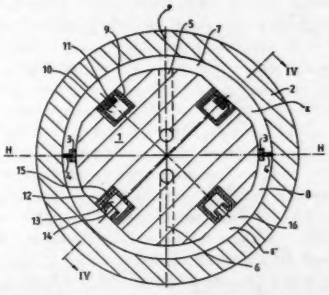
Christian Schiel, Heidenheim, Germany, assignor to J.M. Voith GmbH, Heidenheim, Germany

Filed May 24, 1994, Ser. No. 248,867

Claims priority, application Germany, May 29, 1993, 43 18 035.3

Int. Cl.[6] F16C *13/00*

U.S. Cl. 492—16 **10 Claims**



1. A roll for use in fiber web processing comprising:

a) a fixed central axis;

b) a roll shell adapted to rotate about the central axis;

c) a first chamber disposed between the central axis and the roll shell, said chamber being half-annular in form and filled with a liquid for transferring a hydraulic supporting force from the central axis to the roll shell;

d) a second chamber partially filled with air and partially filled with liquid; and,

e) a plurality of narrow capillary lines connecting the first and second chambers, said capillary lines having a capillary characteristic (K) of between about 2.5×10^{7} m^{-2} and about 2.5×10^{8} m^{-2}.

5,487,716

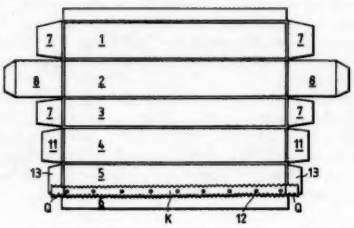
WRAP FILM CONTAINING BOX AND MANUFACTURING METHOD THEREFOR

Tadayuki Yuki, and Iku Kato, both of Mie, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 183,399, Jan. 19, 1994, Pat. No. 5,423,464. This application Mar. 30, 1995, Ser. No. 413,955

Int. Cl.[6] B31B *1/90*

U.S. Cl. 493—86 **3 Claims**



1. A method for manufacturing a wrap film containing cardboard box from a flat, pre-formed, premarked cardboard box blank comprising the steps of:

overlapping a thin long metal plate, having serrations along at least one lateral edge, and a thin sheet body so that at least one lateral end of the thin sheet body projects beyond a lateral end of the thin long metal plate;

forming fastening claws at predetermined locations on an inside surface of a flat, preformed, premarked cardboard box blank by positioning said overlapping metal plate and thin sheet on said inside surface with said thin sheet in contact with said cardboard surface and said serrations positioned to extend beyond an open edge of said box when said box is assembled and opened to dispense wrap film contained therein and by biasing said thin metal serrated plate at spaced intervals along said edge to be opened for forming fastening claws therein and projecting said fastening claws through said cardboard;

fastening said thin metal serrated plate to said cardboard by causing said inserted fastening claws to be bent outwardly from the projection through said cardboard and flat on an opposite surface of said cardboard; and

bending said flat, pre-formed, premarked cardboard box blank, with said thin metal serrated plate affixed thereto, along pre-marked lines to assemble the container box.

5,487,717

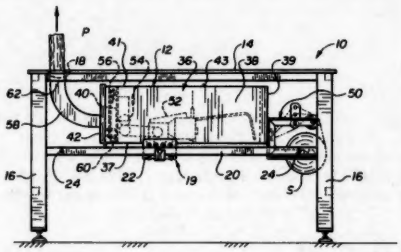
DISPENSING TABLE FOR A CUSHIONING CONVERSION MACHINE

James E. Tekavec, Willoughby, and James A. Simmons, Painesville Township, both of Ohio, assignors to Ranpak Corp., Concord Twp., Ohio

Continuation-in-part of Ser. No. 66,337, May 21, 1993. This application Nov. 23, 1993, Ser. No. 155,931

Int. Cl.[6] B31F *1/10*

U.S. Cl. 493—352 **11 Claims**



1. In combination, a dispensing table and a cushioning conversion machine slidably mounted to the table;

the dispensing table including a substantially horizontal work platform;

the cushioning conversion machine including a frame having an upstream end and a downstream end;

the cushioning conversion machine also including conversion assemblies which are mounted to the frame and which convert stock material into a cushioning product; and

the cushioning conversion machine being slidable to an operating position whereat the cushioning product is deposited on the work platform during operation of the machine wherein the machine is slidably mounted below the work platform; and

wherein the machine includes a final outlet through which the cushioning product emerges and wherein the work platform includes an opening which is aligned with the final outlet when the machine is in the operating position.

5,487,718

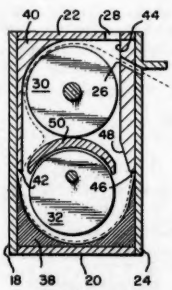
FOLDER FOR SHEET PAPER SUCH AS LETTER-MAIL, FLIERS AND THE LIKE

Tadeusz Staniszewski, Budd Lake, N.J., assignor to Shap, Inc., Demarest, N.J.

Filed Feb. 25, 1994, Ser. No. 202,373

Int. Cl.[6] B65H *45/14*

U.S. Cl. 493—421 **14 Claims**



1. A folder for sheet paper such as letters and fliers, comprising:

a housing;

only one, rotatable, sheet-engaging element journalled in said housing for moving the sheet paper in the housing;

means confined within said housing for driving said element in rotation;

a guide, mounted within said housing in juxtaposition with said element for guiding the sheet paper between the guide and the sheet engaging element in order to fold the sheet paper;

first access means for admitting sheet paper into said housing;

second access means for discharging folded sheet paper from said housing; and

first and second abutment means, within said housing, said first abutment means for engagement thereof by a leading end of the sheet paper and said second abutment means for engagement thereof by a first fold of the sheet paper.

5,487,719

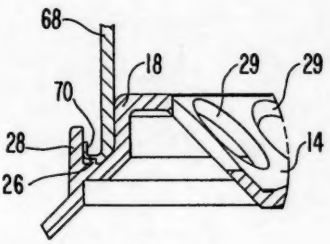
CENTRIFUGE ROTOR ASSEMBLY

James M. Houston, Evergreen, and Kenneth Biggio, Littleton, both of Colo., assignors to Denver Instrument Company, Arvada, Colo.

Filed Jan. 14, 1994, Ser. No. 181,417

Int. Cl.[6] B04B *5/02*

U.S. Cl. 494—16 **19 Claims**



1. A rotor assembly for use in a centrifuge having a drive motor, said rotor assembly comprising:

a rotor having a plurality of apertures for holding fluid containers and a circular groove surrounding said plurality of apertures, said groove including a substantially vertical inner sidewall and a substantially vertical ridge positioned outwardly of said inner sidewall;

an impervious cover that engages said groove and provides a seal to prevent the escape of fluid from said rotor, said cover including an outer substantially vertical surface which fits in sealed engagement with said ridge of said groove and an inner substantially vertical surface which fits in sealed engagement with said sidewall of said groove; and

connection means for permitting the connection and disconnection of said rotor to the centrifuge drive motor while said cover is in the engaged position.

5,487,720

PARTICLE CONCENTRATOR

Dan R. Pace, Halifax, Canada, assignor to Occam Marine Technologies Ltd., Nova Scotia, Canada

Continuation of Ser. No. 777,321, Dec. 2, 1991, abandoned. This application Mar. 28, 1994, Ser. No. 218,464

Claims priority, application Canada, Apr. 3, 1990, 2013694

Int. Cl.[6] B04B *9/00;1/00*

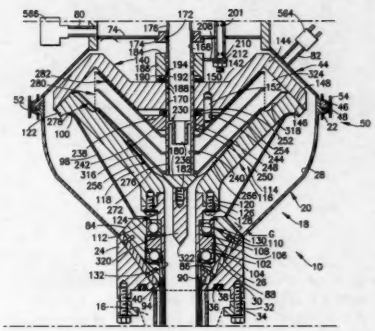
U.S. Cl. 494—35 **21 Claims**

1. A decanting centrifuge assembly for separating particulate matter from a fluid held within a container comprising:

a housing;

lower bearing support means within said housing;

a lower bowl assembly including an upwardly and outwardly flaring lower bowl member affixed to lower bearing means, a cylindrical member extending downwardly therefrom, and bearing means between said lower bearing means and said lower bearing support means for rotatably and bearingly supporting said lower bowl assembly within said housing;



cylindrical transfer tube means extending downwardly into said housing to within said lower bowl member;

an assembly of upwardly and outwardly flaring vertically spaced apart frustoconical discs attached to the lower end of said transfer tube means in an upper discharge chamber of said housing and lower inlet port means adjacent said discs;

apertured connection means integrally connecting said transfer tube means to said lower bearing means;

partition means blocking said transfer tube means between said inlet port means and said connection means;

recycle fluid discharge means in said housing;

an upper bowl member having an outer rim engageable with an outer rim of said lower bowl member and defining a centrifuge chamber with said lower bowl member, said centrifuge chamber enclosing said discs;

means biasing said upper bowl member towards said lower bowl member; and

means for creating a pressure differential between said container and said discharge chamber, said pressure differential serving to transfer fluid from said container into said centrifuge assembly via said cylindrical member, said connection means including an annular portion having a plurality of circumferential spaced aperture extending therethrough and leading from said cylindrical member into said centrifuge chamber.

5,487,721

Patent Not Issued For This Number

5,487,722

APPARATUS AND METHOD FOR INTERPOSED ABDOMINAL COUNTERPULSATION CPR

Sherman E. Weaver, II, and Horace Weaver, both of Box 623, Alvin, Tex. 77512-623

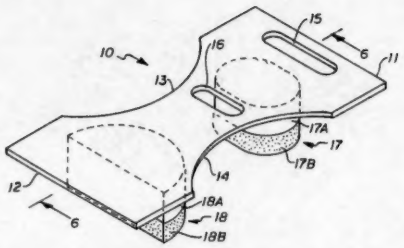
Filed May 3, 1994, Ser. No. 237,720

Int. Cl.[6] A61H *31/00*

U.S. Cl. 601—41 **17 Claims**

1. A device for manually administering interposed abdominal counterpulsation cardiopulmonary resuscitation (IAC-CPR) to a patient comprising:

a longitudinal generally flat rectangular member formed of substantially rigid material having a top side, an underside, and opposed ends configured to be gripped by the left and right hands, respectively, of a person treating the patient, a first force-transmitting element adjustably fixed to said underside configured to engage a patient's chest region, and a second force-transmitting element adjustably fixed to said underside configured to engage the patient's abdominal region;



said first and second force-transmitting elements spaced longitudinally apart from one another;

said rectangular member being positioned on the patient's torso with its longitudinal axis aligned generally with the longitudinal axis of the patient's body and said first and second force-transmitting elements engaged on the patient's chest region and abdominal region, respectively, and said opposed ends being gripped by the hands of the person treating the patient for applying force to said rectangular member; and

manual force being applied by the person treating the patient alternately to each one of said opposed ends in alternating sequence to administer chest compressions in alternating sequence to abdominal compressions.

5,487,723

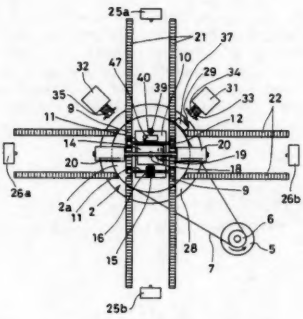
MULTI-DIRECTIONAL ROLLING MASSAGER

Takakazu Ito, 1-866, Kami Higashiozone-cho, Kita-Ku, Nagoya, Japan

Filed Dec. 30, 1993, Ser. No. 175,925

Int. Cl.[6] A61H *15/00*

U.S. Cl. 601—99 **17 Claims**



1. A massager for incorporation into a seat comprising:

a selectively rotatable switch drum having a pair of switch tracks on opposite sides of a center of rotation of said rotatable wwitch drum;

pairs of parallel travel tracks on a same plane with the switch tracks extending radially from said switch drum at ninety degrees angular intervals whereby pairs of said travel tracks extend diametrically in opposite directions from said center of rotation;

a self-propelled carriage having wheels and an electric drive motor for travel from said switch tracks and onto said travel tracks;

means for selectively rotating said switch drum in rotational angular intervals for aligning the switch tracks with diametrically disposed pairs of said parallel travel tracks for travel of said carriage thereon back and forth in opposite directions along paths orthogonal to each other;

said carriage having two rotatable massage rollers disposed extending in opposite directions laterally of said carriage and transported thereon during travel;

means comprising electrical means having controls for sequencing in timed relationship rotation of said switch drum and energizing of said electric motor for effecting travel of said carriage along said paths alternately and back and forth in opposite directions thereon for said massage rollers to massage body parts of a user during travel of said carriage on said travel tracks; and

an enclosure enclosing said massager as a unit with said massage rollers disposed with surfaces which partially project from a side of said enclosure to massage the body parts of a user.

5,487,724

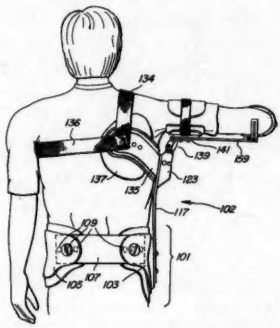
ORTHOPAEDIC SHOULDER BRACE HAVING ADJUSTABLE PELVIC AND ARM SUPPORTS

Shannon R. Schwenn, Orlando, Fla., assignor to Orthomerica Products, Inc., Newport Beach, Calif.

Filed May 27, 1994, Ser. No. 250,056

Int. Cl.[6] A61F *5/00*

U.S. Cl. 602—20 **16 Claims**



1. A shoulder brace adapted to adjustably distribute weight onto a user's waist and hip, comprising:

a pelvic belt having a left rigid shell and a right rigid shell, each of the two rigid shells having an upper curved portion for comfortably fitting around a side of a waist of the user and having a lower curved portion for comfortably fitting onto a hip of the user, each of the two rigid shells being rotatably connected to a rigid joining shell to accommodate different hip sizes of different users;

a thorax band adapted to be wrapped around a portion of the user's torso beneath a shoulder of the user; and

a support connected to one of the rigid shells for connecting the pelvic belt to the thorax band, and adapted to support an arm rest.

5,487,725

PNEUMATIC VITRECTOMY FOR RETINAL ATTACHMENT

Gholam A. Peyman, New Orleans, La., assignor to Syntec, Inc., Winfield, Mo.

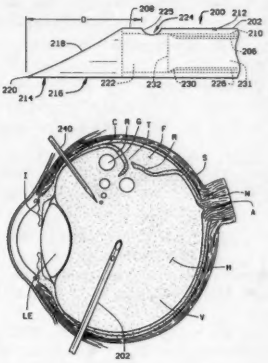
Continuation-in-part of Ser. No. 241,749, May 12, 1994. This application Dec. 1, 1994, Ser. No. 348,051

Int. Cl.[6] A61B *17/20*

U.S. Cl. 604—22 **18 Claims**

1. An instrument for introduction into an eyeball for the treatment of detached retinal tissue comprising:

an outer tube having an aspiration port formed therein;



an inner tube slidably engaged within said outer tube, said inner tube having means thereon for aspirating fluid and tissue through said aspiration port and means for severing said tissue;

means for moving said inner tube within said outer tube; and

a tapered extension tip integrally formed on an end of said outer tube, said extension tip having a sharp cutting edge formed on a periphery thereof capable of piercing the eyeball;

said extension tip being positioned on said outer tube between said aspiration port and the detached retinal tissue so as to prevent the detached retinal tissue from being aspirated into said aspiration port.

5,487,726

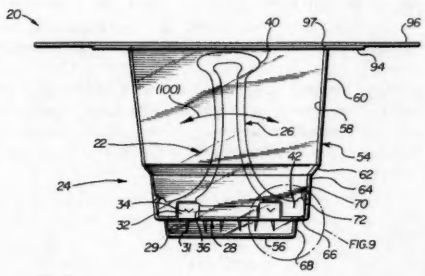
VACCINE APPLICATOR SYSTEM

Richard Rabenau, Birmingham, and Fred E. Williams, Jr., Arab, both of Ala., assignors to Ryder International Corporation, Arab, Ala.

Filed Jun. 16, 1994, Ser. No. 260,882

Int. Cl.[6] A61B *17/20*

U.S. Cl. 604—46 **10 Claims**



1. In a percutaneous vaccine applicator system, a packaging assembly for use with a percutaneous vaccine applicator of the type having a plurality of spikes, said packaging assembly providing for applicator storage and disposal, said packaging assembly comprising:

a container and a removable cover attached to said container, said container having walls and a base panel defining a container cavity, said container cavity being sized and dimensioned for receiving a percutaneous vaccine applicator, a ledge formed in said walls, a ledge rim surface of said ledge being spaced away from an inside surface of said base panel a dimension which is greater than the length of the spikes on a percutaneous vaccine applicator to be retained in said container cavity for maintaining a gap between a tip of the spikes of the applicator and an inside surface of said base panel to prevent the spikes from puncturing said base panel, at least one detent protrusion projecting into said cavity from a corresponding wall, said detent protrusion being spaced from a corresponding portion of said ledge rim to retain a portion of said applicator therebetween prior to use and for disposal after use.

5,487,727

METHOD OF IMPLANTING AN INTRAVASCULAR MEMBRANE LUNG

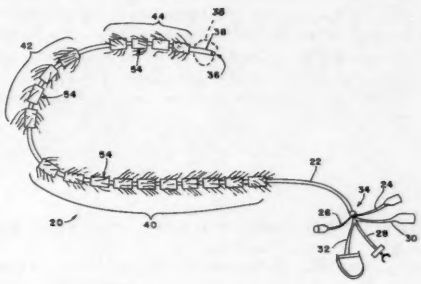
Michael T. Snider, Hershey; Kane M. High, Middletown, both of Pa.; Georg Panol, Warwick, R.I.; James Ultman, State College, Pa.; Russell B. Richard, Hershey, Pa.; John K. Stene, Hummelstown, Pa., and Garfield B. Russell, Palmyra, Pa., assignors to The Penn State Research Foundation, University Park, Pa.

Division of Ser. No. 817,173, Jan. 6, 1992, Pat. No. 5,336,164.

This application Apr. 22, 1994, Ser. No. 232,788

Int. Cl.[6] A61M *37/00;31/00*

U.S. Cl. 604—49 **7 Claims**



1. A method of implanting in a living body an intravascular membrane lung by way of percutaneous insertion into cavities of the body through which blood flows in series including a femoral vein, an inferior vena cava, a right ventricle, a pulmonary artery, and natural lungs, said method comprising the steps of:

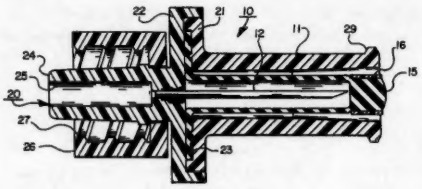
(a) inserting percutaneously into the femoral vein a distal end of an elongated catheter having a longitudinal axis and first and second conduits therethrough, and including a plurality of elongated hollow flexible microporous gas exchange fibers having outer surfaces, said fibers tethered only at one end to the catheter and in communication with the first and second conduits and extending transversely of the longitudinal axis of the catheter;

(b) advancing the catheter into and through the femoral vein until the gas exchange fibers extend transversely of the catheter and are positioned within and substantially coextensive with the pulmonary artery, within and substantially coextensive with the right ventricle, and within and substantially coextensive with the inferior vena cava;

(c) delivering oxygen through the first conduit of the catheter to the gas exchange means and thence to the blood flowing across the gas exchange means; and

(d) removing carbon dioxide from the blood flowing across the gas exchange means, through the gas exchange means, then through the second conduit of the catheter.

5,487,728
CONNECTOR ASSEMBLY
Vincent L. Vaillancourt, 14 Bunyan Dr., Livingston, N.J. 07039
Filed May 19, 1994, Ser. No. 245,893
Int. Cl.[6] A61M *5/00*
U.S. Cl. 604—86 **20 Claims**

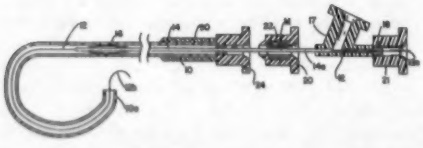


1. A connector assembly comprising

a female luer connector including a housing having a rigid tubular portion projecting therefrom, a hollow needle mounted in said housing concentrically within said tubular portion, a tubular shield mounted over said needle and including a resilient collapsible tubular portion concentric to said needle and a septum at a distal end of said collapsible tubular portion in facing relation to said needle and a ring disposed about said septum to circumferentially compress said septum and prevent circumferential distortion of said septum; and

a male luer connector including a hollow tube for movement coaxially into said rigid tubular portion of said female luer housing, said hollow tube being sized to abut and move said septum into said rigid tubular portion while collapsing said collapsible tubular portion of said shield to effect piercing of said needle through said septum and entry into said hollow tube.

5,487,729
MAGNETIC GUIDEWIRE COUPLING FOR CATHETER EXCHANGE
Ernesto Avellanet, and Ernesto Hernandez, both of Miami Lakes, Fla., assignors to Cordis Corporation, Miami Lakes, Fla.
Continuation of Ser. No. 133,324, Oct. 8, 1993, which is a division of Ser. No. 920,864, Jul. 28, 1992, Pat. No. 5,269,759.
This application Mar. 25, 1994, Ser. No. 217,930
The portion of the term of this patent subsequent to Dec. 14, 2010, has been disclaimed.
Int. Cl.[6] A61M *29/00*
U.S. Cl. 604—96 **5 Claims**



1. Apparatus for facilitating catheter exchange in the vascular system of a patient, which comprises:

a flexible guidewire member for introduction into the vascular system of the patient, said flexible guidewire having first magnetic attraction means along a length of said guidewire member that is adapted to remain outside of the patient's body;

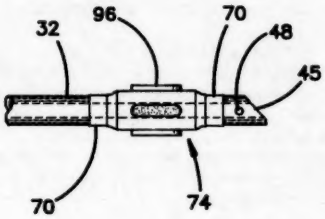
said first magnetic attraction means comprising ferromagnetic material;

a catheter adapted for advancement over said guidewire member;

second magnetic attraction means for positioning outside the patient's body in close proximity to said first magnetic attraction means to retain said guidewire member in position via magnetic force,

whereby said catheter may be withdrawn over said guidewire member while said guidewire member is retained in position in the vascular system of the patient, via magnetic force.

5,487,730
BALLOON CATHETER WITH BALLOON SURFACE RETENTION MEANS
Stuart J. Marcadis, Portage, Ind., and James H. Devries, Grand Rapids, Mich., assignors to Medtronic, Inc., Minneapolis, Minn.
Continuation of Ser. No. 999,488, Dec. 30, 1992, abandoned.
This application May 27, 1994, Ser. No. 250,863
Int. Cl.[6] A61M *29/00*
U.S. Cl. 604—96 **3 Claims**



1. An elongated flexible catheter for supplying perfusion liquid to a bodily vessel having an orifice, the catheter comprising:

a body having a proximal end, a distal end receivable in a vessel by way of the vessel orifice, and an infusion lumen formed within the body and extending between the proximal end and the distal end;

at least one infusion lumen outlet at the catheter distal end for discharge of liquid from the lumen;

a radially expandable sealing member surrounding the body proximally of the outlet, the sealing member being receivable in the orifice in its unexpanded state and expandable into engagement with a vessel wall to form a seal of the orifice thereof;

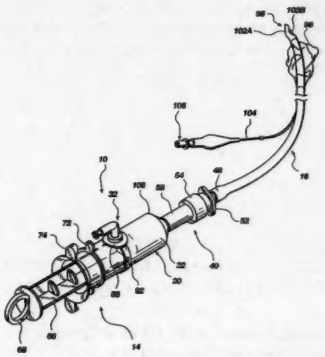
the sealing member including a plurality of spaced apart felt patches affixed to the outer surface of the sealing member to enhance the purchase between the vessel wall and the sealing member in the expanded state to resist removal of the distal end from the vessel and loss of the seal.

5,487,731
ESOPHAGEAL INTUBATION DETECTOR WITH INDICATOR
Marshall T. Denton, Salt Lake City, Utah, assignor to Wolfe Tory Medical, Inc., Salt Lake City, Utah
Filed Feb. 22, 1994, Ser. No. 199,628
Int. Cl.[6] A61M *29/00*
U.S. Cl. 604—100 **22 Claims**

1. An esophageal intubation detection system for use in determining whether a tip of an endotracheal tube is in a patient's esophagus or in the patient's trachea, the system comprising:

the endotracheal tube including the tube tip;

volume changing means having a cavity, for changing the volume of cavity, the cavity being connected to the endotracheal tube; and



an indicator that is activated in response to a significant pressure differential across the indicator and that thereby provides an indication regarding the position of the tube tip, the indicator being pneumatically connected to the endotracheal tube and the volume changing means,

whereby, if the tube tip is in the esophagus, the tube tip becomes occluded musing the significant pressure differential across the indicator as the volume of the cavity changes activating the indicator, and if the tube tip is in the trachea, the tube tip is not occluded and there is no significant pressure differential as the volume of the cavity changes.

5,487,732

SYRINGE WITH RETRACTABLE NEEDLE

Peter Jeffrey, Liverpool, Great Britain, assignor to Safe-T-Limited, Isle of Man, United Kingdom

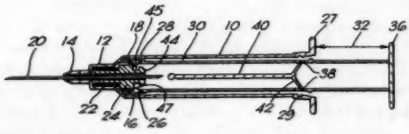
PCT No. PCT/GB93/01004, § 371 Date Dec. 13, 1994, § 102(e) Date Dec. 13, 1994, PCT Pub. No. WO93/23098, PCT Pub. Date Nov. 25, 1993

PCT Filed May 17, 1993, Ser. No. 335,795

Claims priority, application United Kingdom, May 15, 1992, 9210463; Jul. 8, 1992, 9214512

Int. Cl.[6] A61M *5/00*

U.S. Cl. 604—110 **16 Claims**



1. A hollow needle applicator for cartridged drugs etc. including automatic needle retraction after cartridge contents expression, said applicator comprising a cartridge which is at least partially accommodated bodily within a hollow piston actuator or carrier and will be released for retraction under bias thereinto or further thereinto by way of a piston rod serving to operate contents discharge piston provision of said cartridge and said piston further having deflectable arms that extend sideways further than side walling of said cartridge and into temporary latching engagement with holding formation of said piston actuator or carrier until released by deflection of the arms by engagement with open rear end of said cartridge.

5,487,733

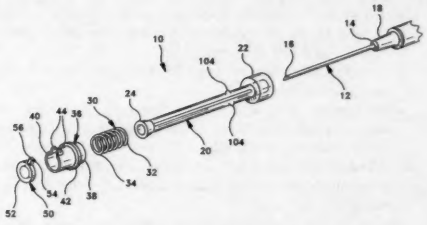
ASSEMBLY WITH COLLAPSIBLE SHEATH AND TIP GUARD

Richard J. Caizza, Barry Lakes, and Jon S. Bell, Midland Park, both of N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 309,372, Sep. 20, 1994, abandoned. This application Apr. 11, 1995, Ser. No. 420,890

Int. Cl.[6] A61M *5/00*

U.S. Cl. 604—110 **28 Claims**



1. A needle assembly comprising:

a needle cannula having a pointed tip;

a first collapsible member surrounding at least a portion of said needle cannula and being resiliently biased toward an expanded condition in which a portion of said first collapsible member approaches said tip;

a tip guard mounted to said first collapsible member for selective movement toward and away from said needle cannula; and

a second collapsible member disposed intermediate said first collapsible member and said needle cannula and surrounding at least a portion of said needle cannula, said second collapsible member being resiliently biased toward and expanded condition in which a portion of said second collapsible member approaches said tip, said second member being configured to activate said tip guard and move said tip guard into covering relationship with said tip when said first and second members are in said respective expanded conditions.

5,487,734

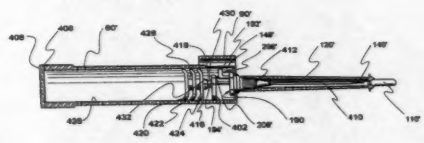
SELF RETRACTING CATHETER NEEDLE APPARATUS AND METHODS

Gale H. Thorne, Bountiful, and David L. Thorne, Kaysville, both of Utah, assignors to Specialized Health Products, Inc., Bountiful, Utah

Continuation-in-part of Ser. No. 370,728, Jan. 10, 1995. This application May 8, 1995, Ser. No. 436,976

Int. Cl.[6] A61M *5/32*

U.S. Cl. 604—195 **11 Claims**



1. A disposable, single-use, self-retracting catheter insertion needle assembly and housing in which the needle assembly is stored and transported, said needle assembly comprising:

the housing having a manually distortable section, providing a medically safe transport package for the needle assembly, and having an exit and reentry end for a portion of the needle assembly;

a needle cover disposed for transport within the housing and being a part of the portion;

an elongated medical needle disposed within the housing and further within the needle cover and having a sharpened end disposed toward the exit and reentry end of the housing;

a catheter disposed about the elongated needle;

a needle cover attachment hub disposed about said medical needle and separably attachable to and detachable from the needle cover, said cover attachment hub being disposed about said needle during transport and before and during blood withdrawal but separable therefrom;

said cover attachment hub further comprising a latch which, for needle insertion, is positioned to lock said needle assembly at a predetermined position relative to said exit and reentry end whereat the needle extends outward from said housing and is thereby positioned for use;

a distal part of the assembly firmly affixed to said medical needle at at least an end of the assembly distal from the sharpened end, said distal part comprising:

a separable attachment between the distal part and said cover attachment hub;

an attachment release apparatus integrally associated with said separable attachment and disposed in close communication with an internal surface in close communication with the distortable section of said housing such that the release apparatus is actuated by manual distortion of that section of said housing;

means for affixing said needle assembly to a linear motion force storage apparatus which derives return energy for needle retraction from needle extension through the needle exit and reentry end.

5,487,735

Patent Not Issued For This Number

5,487,736

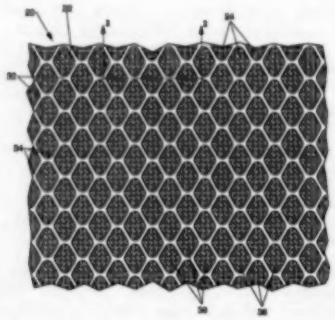
MULTI-TOPOGRAPHY SUBSTRATE HAVING SELECTIVELY DISPOSED OSMOTIC ABSORBENT, INCORPORATION THEREOF IN A DISPOSABLE ABSORBENT ARTICLE AND PROCESS OF MANUFACTURE THEREFOR

Dean Van Phan, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 153,863, Nov. 17, 1993, abandoned. This application May 5, 1995, Ser. No. 435,556

Int. Cl.[6] A61F *13/15;13/20*

U.S. Cl. 604—368 **19 Claims**



1. An absorbent structure comprising:

a fibrous capillary substrate having two elevations, a first elevation defining a first pattern and a second elevation defining a second pattern, each said elevation comprising one or more regions, said regions having two different densities, a relatively high density and a relatively low density, whereby said fibers of said substrate are deflected in said regions having said low density; and

an immobilized osmotic absorbent cured in situ from a liquid precursor and disposed on one or more of said regions corresponding to one of said elevations of said capillary substrate.

5,487,737

STORAGE AND TRANSFER BOTTLE DESIGNED FOR STORING A COMPONENT OF A MEDICAMENTAL SUBSTANCE

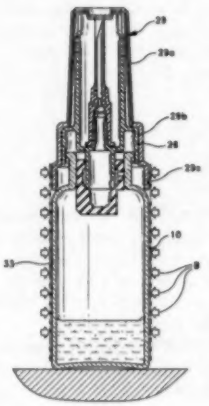
Gabriel Meyer, Vesenaz, Switzerland, assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 566,423, Aug. 29, 1990, abandoned. This application Oct. 18, 1993, Ser. No. 138,878

Claims priority, application Switzerland, Dec. 27, 1988, 4805/88; Jan. 30, 1989, 3919/89

Int. Cl.[6] A61J *1/00*

U.S. Cl. 604—403 **21 Claims**



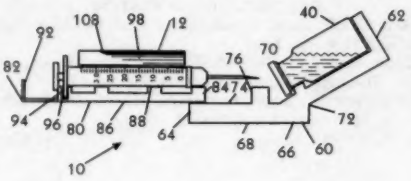
1. A single compartment storage and transfer bottle designed for storing a medicinal substance and for transferring the medicinal substance, said bottle including a hollow body opened at one end and forming a restricted open neck, a capsule slidably mounted to said neck, a stopper device being engagable within said restricted open neck and supported by said capsule, said bottle being sterilizable and being designed to resist thermal strains of lyophilization, said stopper device having an internal cavity and at least one radial canal communicating with said internal cavity, a transfer device mounted to said capsule and communicating with the internal cavity of said stopper device, said stopper device being displacable between a storage position in which said stopper device constitutes an impermeable seal with said restricted open neck and said radial canal is closed by an inner surface of said restricted open neck, and a utility position in which said radial canal communicates with an interior of said bottle to form an opening for allowing evacuation of said medicinal substance from said bottle through said radial canal and said internal cavity, a cap covering at least a portion of said capsule, and an annular seal extending between said cap and bottle body, said seal holding said cap on said bottle body.

5,487,738

APPARATUS FOR DRAWING FLUIDS INTO A HYPODERMIC SYRINGE

Eugene B. Sciulli, 1024 N. Shore Dr. NE., St. Petersburg, Fla. 33701-1440

Filed Mar. 31, 1995, Ser. No. 414,436
Int. Cl.[6] A61B 19/00
U.S. Cl. 604—414 8 Claims



1. A new and improved apparatus for drawing fluid into a hypodermic syringe comprising, in combination:

a hypodermic syringe of the type having a cylindrical container for fluids to be dispensed, the hypodermic syringe having an open proximal end and a distal end with a needle at the distal end and a shoulder at the proximal end, the hypodermic syringe also having a reciprocal rod with a distal end formed with a piston positioned interior of the container, the rod also having a proximal end with a plunger for reciprocating the piston for drawing fluids into the cylinder and the forcing of fluids therefrom;

a vial having a closed cylindrical extent at its lower end and a neck of a reduced diameter with an opening at its upper end and a closure pierceable by a needle, the bottle also having a quantity of medicinal fluid therein for being drawn from the vial by a needle of a hypodermic syringe;

a holder having a distal end and a proximal end and a central extent therebetween with a planar lower surface therebeneath, the distal end including an upper support surface adapted to support the vial of medicinal fluid, the support surface being formed at an angle of about 30 degrees with respect to the lower surface and sloping downwardly toward the central extent of the holder, the upper surface of the proximal end being planar and provided with a forward stop perpendicular to the upper surface;

a reciprocable platform having a proximal end and a distal end with a lower horizontal surface slidable upon the upper surface at the proximal end of the holder, the platform also having an upper surface formed with a curvature adapted to receive thereon the hypodermic syringe, the platform also having an upturned distal end adapted to limit the withdrawal movement of the plunger, the platform also having a recess at a central extent adapted to receive the shoulder to preclude axial movement thereof; and

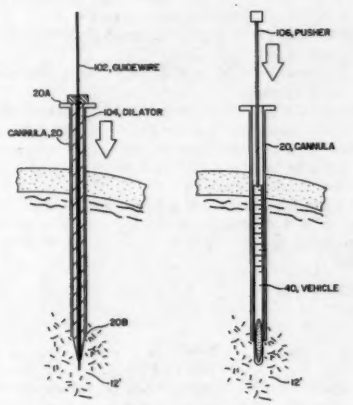
a base having a planar upper horizontal surface adapted to receive thereon the lower horizontal surface of the holder with coupling components therebetween.

5,487,739

IMPLANTABLE THERAPY SYSTEMS AND METHODS

Patrick Aebischer, Barrington; Moses Goddard, Tiverton, both of R.I.; John G. Moldauer, Brooklyn; Paul J. Mulhauser, New York, both of N.Y.; Anne M. Rathbun, Providence, R.I.; Paul R. Sanberg, Greenwich, R.I.; Alfred V. Vasconcellos, Cranston, R.I., and Nicholas F. Warner, Belmont, Mass., assignors to Brown University Research Foundation, Providence, R.I.

Continuation of Ser. No. 998,368, Dec. 30, 1992, abandoned, which is a continuation-in-part of Ser. No. 722,947, Jun. 28, 1991, abandoned, which is a continuation-in-part of Ser. No. 369,296, Jun. 19, 1989, abandoned, which is a continuation-in-part of Ser. No. 121,626, Nov. 17, 1997, Pat. No. 4,892,538.
This application Jun. 2, 1995, Ser. No. 459,815
Claims priority, application WIPO, Jun. 25, 1992, PCT/US92/05369
Int. Cl.[6] A61K 9/22
U.S. Cl. 604—890.1 20 Claims



1. A system for delivering a biologically active factor to a selected treatment site in a subject, comprising:

i) a single cannula adapted for penetration through tissue into a selected position in proximity with the treatment site, having a bore with a substantially smooth interior surface running axially therethrough through which a vehicle may slidably move, an open, proximal end into which the vehicle may be slidably inserted and a distal end having an opening through which the vehicle may slidably move wherein the external diameter and bore diameter are tapered toward the distal tip;

ii) an obturator disposable within the cannula to prevent tissue material from entering the distal end of the cannula when it is inserted into tissue;

iii) a vehicle which encapsulates the biologically active factor, the vehicle having an outer surface which comprises a biocompatible semipermeable outer membrane through which the biologically active factor may be released into the selected treatment site, and a shape which enables slidable insertion into the proximal end of the cannula, slidable movement along the bore of the cannula, slidable passage through the distal end of the cannula by removal of the cannula from the proximity of the treatment site; and

iv) a pusher disposable within the cannula to engage the outer surface of the vehicle, to slidably move the vehicle through the bore, and to hold the vehicle in place at the selected treatment site when the cannula is removed from the proximity of the treatment site, the pusher being removable after the vehicle is positioned at the treatment site.

5,487,740

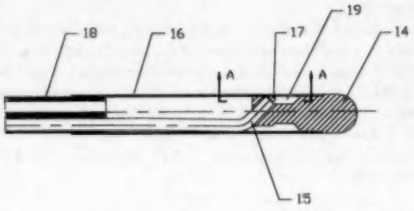
LASER DEVICE FOR ABLATION OF HUMAN TISSUE

Stanislaw Sulek, Irvine, and Hany M. G. Hussein, Newport Beach, both of Calif., assignors to Energy Life Systems Corporation, Costa Mesa, Calif.

Filed Mar. 2, 1994, Ser. No. 204,980

Int. Cl.[6] A61B *17/36*

U.S. Cl. 606—15 **19 Claims**



19. A lasing catheter for laser ablation of human tissue, in a selected body cavity comprising in combination:

said lasing catheter having an elongated flexible body with a solid distal end region;

located in least one laser port at said solid distal end region having an aperture;

at least one elongate fiberoptic in said lasing catheter terminating at said aperture in said laser port for directing a laser beam outwardly through said fiberoptic at a target site near aperture in said laser port; and said fiber optic being adjacent said aperture;

a cap made from a material that can absorb laser light and generate heat mounted to said distal end region covering said laser port so as to absorb all of said laser light from said laser beam.

5,487,741

BONE PLATE

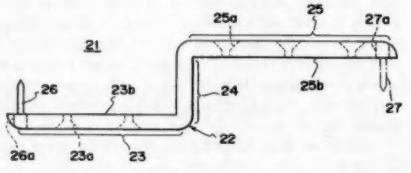
Yu Maruyama; Yoshu Taguchi, both of Tokyo, and Kijuro Hayano, Chino, all of, Japan, assignors to Taguchi Medical Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1993, Ser. No. 152,426

Claims priority, application Japan, Nov. 16, 1992, 4-084967 U

Int. Cl.[6] A61B *17/56;17/58;* **A61F** *2/30;2/28*

U.S. Cl. 606—60 **13 Claims**



1. A bone plate adapted to be attached to a surface of a bone across a broken-away portion of the bone to thereby fix the broken-away portion, said bone plate comprising:

a body including a bent portion between a pair of mount portions;

said mount portions having bottom surfaces adapted to contact the bone and upper surfaces adapted to be compatible with upper tissue, said mount portions extending from said bent portion to opposite ends of said body and being substantially parallel to each other, said bottom surfaces oppositely facing each other,

said bent portion extending in a direction having an angle with respect to a plane of at least one of said bottom surfaces;

at least one opening formed in said body for receiving a fastener therein and fixing said bone plate; and

at least one pin protruding from at least one of said bottom surfaces of said body, adapted to be driven into the bone to thereby at least tentatively set said body relative to the bone.

5,487,742

TRANSVERSE FIXATION DEVICE FOR A SPINAL OSTEOSYNTHESIS SYSTEM

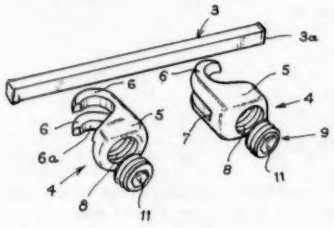
Yves P. Cotrel, Paris, France, assignor to Sofamore Danek Group, Memphis, Tenn.

Continuation of Ser. No. 666,665, Mar. 7, 1991, abandoned. This application Nov. 24, 1993, Ser. No. 158,156

Claims priority, application France, Mar. 8, 1990, 90 02970

Int. Cl.[6] A61F *5/00*

U.S. Cl. 606—61 **27 Claims**



1. A spinal osteosynthesis system, comprising:

a spinal rod configured to be implanted on a spinal segment;

a transverse bar; and

a fixation element including;

a body; and

a bifurcated hook portion attached to said body, said hook portion defining two hook-shaped blades extending outwardly from said body and defining a first surface for engaging the rod, said blades being spaced apart along their outward extension a distance at least equal to a width of the transverse bar, and

said body defining a second surface between said blades configured to slidingly engage a corresponding side of the transverse bar when the bar is fully seated between said blades.

5,487,743

ANTERIOR DORSO-LUMBAR SPINAL OSTEOSYNTHESIS INSTRUMENTATION FOR THE CORRECTION OF KYPHOSIS

Jean-Marie Laurain, Pouilley les Vignes, France; Ronald L. DeWald, Chicago, Ill.; Jean-François D'Amore, Stella Plage, and Guy Deneuvillers, Merlimont, both of, France, assignors to Sofamore, S.N.C., Rang-au-Fliers, France

Filed Feb. 15, 1994, Ser. No. 196,517

The portion of the term of this patent subsequent to Apr. 28, 2009, has been disclaimed.

Int. Cl.[6] A61B *17/70;17/80*

U.S. Cl. 606—61 **8 Claims**

1. Anterior dorso-lumbar spinal osteosynthesis instrumentation for the correction of kyphosis due to the destruction of one or two vertebral bodies, comprising in combination:

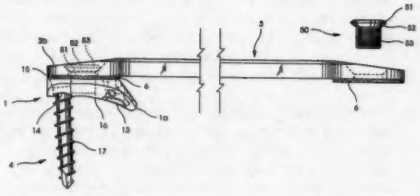
a pair of vertebral implants;

bone screws for anchorage of said implants to two corresponding vertebrae located on each side of a damaged vertebra;

a plate having two end portions for connection to said two implants;

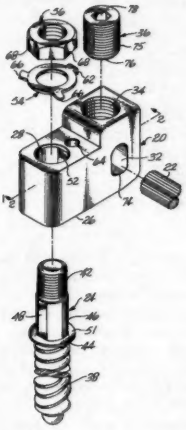
means for fixing said end portions to said implants;

said two end portions of said plate having a rounded periphery; and



said fixing means including first apertures defined in each of said implants, second apertures defined in said end portions of said plate, and fixing screws provided with rounded heads so that the surface of said fixing screws is flush with the surface of said plate when said fixing screws are anchored in a central aperture of said first apertures of said implants and said second apertures of the respective end portions of said plate.

5,487,744
CLOSED CONNECTOR FOR SPINAL FIXATION SYSTEMS
Robert S. Howland, Seal Beach, Calif.; assignor to Advanced Spine Fixation Systems, Inc., Cypress, Calif.
Continuation of Ser. No. 45,370, Apr. 8, 1993, abandoned. This application Apr. 15, 1994, Ser. No. 227,907
Int. Cl.[6] A61B *17/70*
U.S. Cl. 606—61 **16 Claims**



1. A clamp assembly for connecting a spine rod to a vertebra fasteners, the clamp assembly comprising:

a spine rod;

a vertebra fastener including a shaft having a first threaded end for insertion into a vertebra and a second threaded end for receiving a threaded nut;

an L-shaped clamp having a body portion forming one side of the L-shape and a foot portion forming the foot of the L-shape comprising:

a first outward, away-from-the-spine surface forming one side of the body portion of the L-shape;

a first aperture for receiving the shaft of the vertebra fastener with an opening of the first aperture in the first outward, away-from-the-spine surface;

a second aperture for receiving the spine rod and cooperating with the spine rod to securely grip the rod to the body portion;

a second outward, away-from-the-spine surface forming one end of the foot portion of the L-shape, having surface plane which is not co-planar with the first outward, away-from-the-spine surface; and

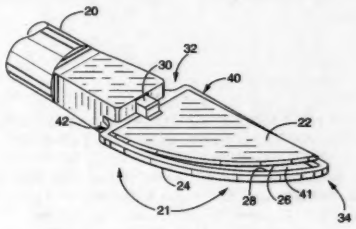
a threaded aperture, with an opening of the threaded aperture in the second outward, away-from-the-spine surface, in communication with the second aperture;

a set screw for threading into the threaded aperture to clamp the spine rod within the second aperture;

a threaded nut having an upper surface and a lower surface for fastening the body portion to the second threaded portion of the vertebra fastener wherein when the nut is threaded to the vertebra fastener and the lower surface rests on the first outward, away-from-the-spine surface, the upper surface is substantially coplanar with the second outward away-from-the-spine surface so that the assembled clamp has a generally flat planar profile outward, away from the spine, without any portions substantially protruding from the clamp outwardly, away from the spine, thereby inhibiting irritation to the back muscles of a patient once the system is installed; and

means for locking the nut to the body portion to prevent the nut from loosening.

5,487,745
CURVILINEAR SURGICAL PUNCH
Thomas P. McKenzie, 851 Tilden Dr., Lodi, Calif. 95242
Continuation of Ser. No. 65,842, May 21, 1993, abandoned. This application Mar. 7, 1994, Ser. No. 208,073
Int. Cl.[6] A61B *17/32*
U.S. Cl. 606—83 **12 Claims**



3. A surgical instrument, comprising:

(a) a lower frame member having a proximal end and a distal end, said lower frame member being substantially planar from said proximal end to said distal end, said lower frame member including a cavity;

(b) an upper blade member having a proximal end and a distal end, said upper blade member having a length and a width, said upper blade member being substantially planar from said proximal end to said distal end, said proximal end of said upper blade member pivotally coupled to said proximal end of said lower frame member;

(c) support means for supporting said upper blade member and said lower frame member and for articulating said upper blade member in relation to said lower frame member between an open position and a closed position wherein said upper blade member is received in said cavity in said lower frame member in said closed position and wherein said upper blade member and said lower frame member lie in substantially parallel planes in said closed position; and

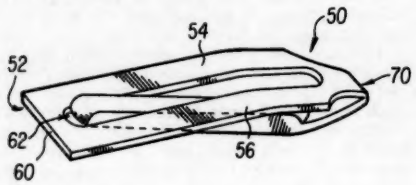
(d) said upper blade member having a top surface and a bottom surface, said top surface lying in a first plane, said bottom surface lying in a second plane, said first and second planes being substantially parallel, said bottom surface being continuously planar across the entire length and width of said upper blade member, said upper blade member including first and second rectilinear edges, said upper blade member including a curvilinear edge which is honed between said first and second planes, said curvilinear edge extending from said proximal end to said distal end of said upper blade member.

5,487,746

SURGICAL CLIP HAVING A LONGITUDINAL OPENING THROUGH WHICH CLAMPED TISSUE PROTRUDES

George W. Yu, 1326 Bayhead Rd., Annapolis, Md. 21401, and H. Logan Holtgrewe, 473 Fair Oak Dr., Severna Park, Md. 21146

Filed Nov. 23, 1994, Ser. No. 347,081
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—151 22 Claims



1. A surgical clip comprising:

a first side having a first leg; and

a second side having a second leg and a third leg connected to each other at a joining region at which the first leg is joined to the second and third legs, the second and third leg defining a longitudinal opening therebetween and extending through the second side;

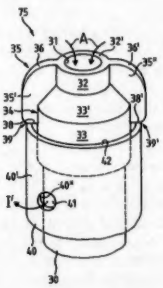
wherein when tissue between the first leg of the first side and the second and the third legs of the second side is clamped by the surgical clip, the first leg pushes a portion of the tissue through the longitudinal opening, and at least a portion of the first leg intersects a plane defined by the second and third legs.

5,487,747

OPTHALMIC SURGICAL APPARATUS FOR MACERATING AND REMOVING THE LENS NUCLEUS FROM THE EYE OF A LIVING BEING

Robert Stagmann, Pretoria, South Africa, and Rudolf Demmerle, Schaffhausen, Switzerland, assignors to Grieshaber & Co. AG Schaffhausen, Schaffhausen, Switzerland

Filed May 3, 1994, Ser. No. 237,707
Claims priority, application Switzerland, May 7, 1993, 01470/93; Apr. 9, 1994, 01042/94
Int. Cl.[6] A61B *17/32*
U.S. Cl. 606—166 23 Claims



1. An ophthalmic surgical device for macerating and removing the lens nucleus of the eye of a living being, comprising:

a housing defining an axis and being adapted for gripping by a user; and

cutting means supported by said housing for macerating the lens nucleus, said cutting means including a tubular probe received coaxially within said housing, a cutting element extending in elongation of said tubular probe in axial direction beyond said housing in form of at least two rotatable wing-like blades oriented approximately transversely to the axis and defining an inlet opening in communication with said tubular probe, and a mounting attached to a forward position of said housing and secured to said tubular probe, said mounting being traversed by said inlet opening and supporting said wing-like blades,

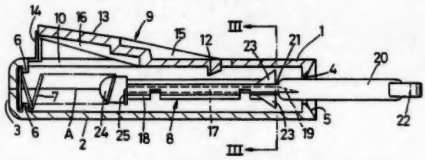
said housing having a first passageway for introducing a fluid to said wing-like blades and a second passageway suitably sealed from said first passageway for withdrawing macerated lens nucleus via said inlet opening and said tubular probe, wherein said mounting is of approximate funnel-shaped configuration, with a first cylindrical section secured to said tubular probe, a conical section having one end connected to said first cylindrical section and another end, and a second cylindrical section connected to said other end of said conical part and having an upper surface, said wing-like blades being attached to said mounting and having an upper surface which extends flush with said upper surface of said second cylindrical section.

5,487,748

BLOOD SAMPLING DEVICE

Jeremy Marshall, and David D. Crossman, both of Oxford, United Kingdom, assignors to Owen Mumford Limited, Oxford, United Kingdom

PCT No. PCT/GB93/00650, § 371 Date Sep. 27, 1994, § 102(e) Date Sep. 27, 1994, PCT Pub. No. WO93/19671, PCT Pub. Date Oct. 14, 1993
PCT Filed Mar. 30, 1993, Ser. No. 307,624
Claims priority, application United Kingdom, Apr. 1, 1992, 9207120
Int. Cl.[6] A61B *5/14*
U.S. Cl. 606—182 7 Claims



1. A disposable pricker comprising an elongate body with a lancet non-rotatably carried therein, the lancet tip normally being within the body, a spring urging the lancet in a direction to project its tip from the body, a trigger mechanism carried by the body with a portion within the body arranged to retain the lancet in a fully retracted position energizing the spring and a second portion outside the body manually actuable to release the lancet to cause the tip to have a momentary position projecting from an opening in the forward end of the body, and a cap encasing the lancet tip and having a shank traversing said opening, wherein said shank extends outwardly of said body through said opening a distance sufficient to permit said lancet to be moved against the action of said spring to said fully retracted position solely by pushing said cap further into said body through said opening, and wherein said cap is breakable free of the lancet by twisting when so retracted to leave the tip exposed within said body.

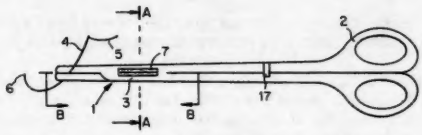
5,487,749

SURGICAL NEEDLE HOLDER

James R. Smith, Flat 2, 193 Sutherland Avenue, Little Venice, London W9 1ET, England

Filed Mar. 23, 1994, Ser. No. 216,398
Claims priority, application United Kingdom, Mar. 24, 1993, 9306080
Int. Cl.[6] A61B *17/06*
U.S. Cl. 606—205 2 Claims

1. A surgical needle holder which comprises:



a) a pair of elongate members which are linked together at a pivot point in scissors-like fashion and which include projecting jaw portions forming jaws for releasably holding a surgical needle;

b) handle portions for opening and closing the jaws, said handle portions being shaped to provide a gap between the handle portions in the region of the pivot point when the projecting jaw portions are closed, said gap being dimensioned to receive a tip of the surgical needle; and

c) wherein at least one of said handle portions includes a protrusion extending therefrom and towards the other handle portion, said protrusion located on said at least one handle portion to extend into said gap so as to guard the tip of the needle and prevent the needle tip passing between the handle portions.

5,487,750

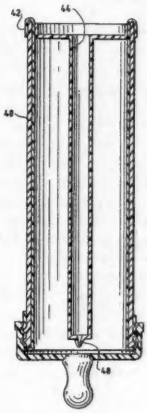
NURSING BOTTLE WITH MEDICATION DISPENSER

Mark T. Burchett, and Lori W. Burchett, both of 10505 Golf Rd., Orland Park, Ill. 60462

Continuation-in-part of Ser. No. 61,698, May 12, 1993, Pat. No. 5,383,906. This application Sep. 29, 1994, Ser. No. 315,201

Int. Cl.[6] A61J *17/00*

U.S. Cl. 606—236 **7 Claims**



1. A liquid medication dispenser suitable for delivering a controlled mixture of palatable beverage into which a liquid medication has been diluted comprising:

a. a bottle having a top opening and bottom end;

b. a nipple assembly attached to said top opening and having at least one perforation therein to allow liquid to pass through;

c. a deformable container placed within said bottle for containing formula or other pallable beverage, said deformable container having a bottom end a top end and a longitudinal axis extending from said bottom end to said top end of said deformable container;

d. at least one tab projecting from the bottom end of said deformable container for securing said deformable container to the bottom end of said bottle;

e. an internal sleeve extending longitudinally from the bottom end of said deformable container through the longitudinal access of said container and having an open proximal end situated at the bottom end of said deformable container and a distal end facing the top opening of said bottle;

f. a syringe suitable for insertion in the proximal end of said internal sleeve;

g. an elongated hollow tip formed on the distal end of said internal sleeve and extending a predetermined distance towards the perforation in said nipple assembly;

5,487,751

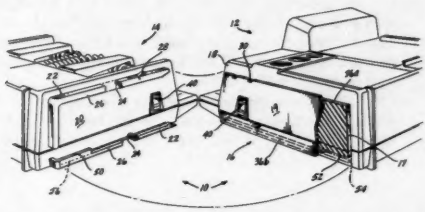
MECHANICAL CONNECTOR FOR SECURING COMPATIBLE MEDICAL INSTRUMENTS TOGETHER

Stephen W. Radons, Snohomish; Steven L. King, Kirkland; Randall D. Mills, Woodinville, and Cliff Cristobal, Kirkland, all of Wash., assignors to Physio-Control Corporation, Redmond, Wash.

Filed Nov. 4, 1994, Ser. No. 334,624

Int. Cl.[6] A61B *19/02*

U.S. Cl. 607—1 **2 Claims**



1. A mechanical connector for securing a first and a second medical instrument together, wherein said first and second medical instruments include an electrical interface through which data can be transmitted from the first instrument to the second instrument, the connector comprising:

a tongue portion disposed on the first instrument, the tongue portion including a joining section disposed on a side wall of the first instrument and an outer wall disposed on the joining section, the outer wall having a width that is wider than the joining section to create a top and a bottom channel between the outer wall and the side wall of the first instrument, the top channel having a substantially uniform depth along its entire length and the bottom channel having a first depth along a major portion of its length and a second depth that is deeper than the first depth at a rearward portion of the bottom channel, said deep portion of the bottom channel defining a keyway;

a groove portion disposed on a side wall of the second instrument, the groove portion including a pair of angle flanges extending from the side wall of the second instrument, said groove portion being capable of receiving said outer wall of the tongue portion such that the electrical interfaces of the first and second instruments are engaged.

5,487,752

AUTOMATED PROGRAMMABLE STIMULATING DEVICE TO OPTIMIZE PACING PARAMETERS AND METHOD

Rodney W. Salo, Fridley; Julio C. Spinelli, Shoreview, and Bruce A. Tockman, Minneapolis, all of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

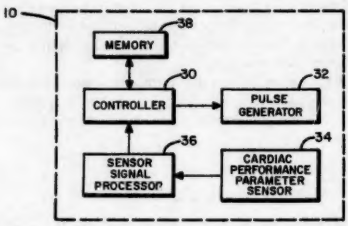
Filed Nov. 15, 1994, Ser. No. 339,567

Int. Cl.[6] A61N *1/365*

U.S. Cl. 607—17 **18 Claims**

1. A cardiac stimulator system comprising:

(a) a cardiac stimulator for normally applying cardiac stimulating pulses having programmable pacing cycle parameters to a heart during a first predetermined time interval sufficiently long to establish a baseline condition for a cardiac performance parameter;



(b) means for measuring and storing values of said cardiac performance parameter;

(c) means for periodically changing one of said programmable pacing cycle parameters during a second predetermined time interval that is only a small fraction of said first predetermined time interval;

(d) means including said means for measuring and storing values of said cardiac performance parameter for measuring and storing values of said cardiac performance parameters during successive ones of said first and second predetermined time intervals; and

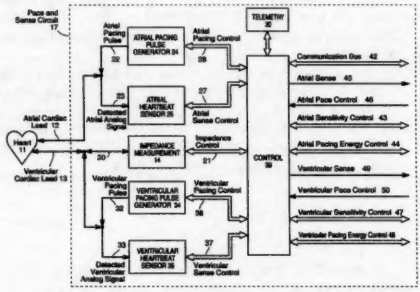
(e) means for determining whether an improvement in said cardiac performance parameter over the baseline condition occurs during ones of said second predetermined time intervals.

5,487,753

RATE-RESPONSIVE PACEMAKER WITH ANAEROBIC THRESHOLD ADAPTATION AND METHOD

Dean J. MacCarter, Englewood; Don Hopper, Denver; Daniel Cooper, Lakewood, and Roger Hassell, Golden, all of Colo., assignors to Telectronics Pacing Systems, Inc., Englewood, Colo.

Filed Mar. 16, 1995, Ser. No. 405,507
Int. Cl.[6] A61N *1/365*
U.S. Cl. 607—017 **27 Claims**



1. A rate responsive pacemaker comprising:

sensing means for sensing a metabolic demand parameter of a patient;

converting means for converting said metabolic demand parameter into a pulse rate, said converting means receiving said metabolic demand parameter and determining in response thereto a pulse rate in accordance with a preselected function, said function being based on the anaerobic threshold level of said patient; and

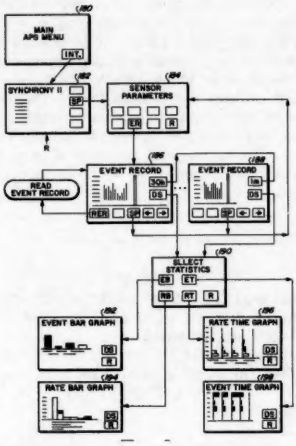
pulse generating means for generating heart pulses corresponding to said pulse rate.

5,487,754

METHOD AND APPARATUS FOR REPORTING AND DISPLAYING A SEQUENTIAL SERIES OF PACING EVENTS

Jeffery D. Snell, Northridge; Harold C. Schloss, Los Angeles; Brian M. Mann, Beverly Hills; John W. Poore, South Pasadena, and Roy B. Medlin, West Hills, all of Calif., assignors to Pacesetter, Inc., Sylmar, Calif.

Division of Ser. No. 846,460, Mar. 2, 1992, Pat. No. 5,431,691. This application Oct. 25, 1994, Ser. No. 328,217
Int. Cl.[6] A61N *1/37*
U.S. Cl. 607—27 **35 Claims**



1. A system for reporting a sequential series of pacing events for use with an implantable pacemaker, said implantable pacemaker having means for storing pacing event data and means for telemetrically transmitting said pacing event data, said system comprising:

means for telemetrically receiving said pacing event data;

means for displaying a rate axis;

means for displaying a time axis orthogonal to the rate axis;

means for displaying a plurality of symbols arranged in a timed sequence relative to the time axis, said symbols representing pacing events, as recorded within said pacing event data, that have occurred in the sequence displayed, said symbols being positioned relative to the rate axis to indicate the rate at which the pacing events occurred; and

means for displaying a time scale indication that provides a graphical depiction of the time scale associated with the displayed timed sequence of symbols, and an indication of how much of the total time represented by said pacing event data is currently being displayed.

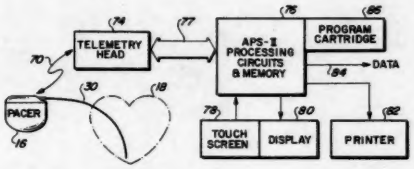
5,487,755

METHODS FOR DISPLAYING A SEQUENTIAL SERIES OF PACING EVENTS

Jeffery D. Snell, Northridge; Harold C. Schloss, Los Angeles; Brian M. Mann, Beverly Hills; John W. Poore, South Pasadena, and Roy B. Medlin, West Hills, all of Calif., assignors to Pacesetter, Inc., Sylmar, Calif.

Division of Ser. No. 846,460, Mar. 2, 1992, Pat. No. 5,431,691. This application Oct. 25, 1994, Ser. No. 328,218
Int. Cl.[6] A61N *1/37*
U.S. Cl. 607—27 **17 Claims**

1. A method for operating a pacing system, said pacing system comprising An external device and an implantable pacemaker, for reporting a sequential series of pacing events that occur within said implantable pacemaker, said external device having a display, a memory, and telemetry means for establishing a telemetric link



with said pacemaker, said pacemaker having means for pacing a patient's heart, said pacemaker further having means for detecting the occurrence and rate of a plurality of specified pacing events and sequentially recording the occurrence and rate of each event in the order in which it occurs in an event record, said event record being stored in a memory buffer within said pacemaker, said pacemaker further having a telemetry circuit coupled to said memory buffer for selectively telemetering data from said memory buffer to said external device, said method comprising:

(a) establishing said telemetric link between said telemetry means of said external device and said telemetry circuit of said pacemaker;

(b) downloading into said memory of said external device said event record from said memory buffer of said pacemaker via said telemetric link with said telemetry circuit of said pacemaker;

(c) processing said event record to determine a pacing event type and rate and time of occurrence for each specified pacing event within said event record; and

(d) displaying, on said display of said external device, a graphical depiction of the pacing events in said event record as a function of rate and time.

5,487,756

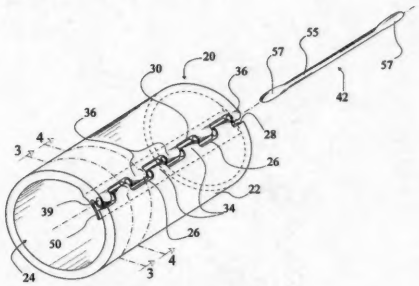
IMPLANTABLE CUFF HAVING IMPROVED CLOSURE

Klaus Kallesoe, Burnaby; Joaquin A. Hoffer, Anmore; Kevin Strange, Port Moody, and Ignacio Valenzuela, Richmond, all of, Canada, assignors to Simon Fraser University, Burnaby, Canada

Filed Dec. 23, 1994, Ser. No. 363,334

Int. Cl.[6] A61N *1/05;1/04*

U.S. Cl. 607—118 **30 Claims**



1. An implantable cuff comprising:

(a) a flexible tubular cuff member having a longitudinal slit extending through a wall thereof, said slit having first and second edges; and

(b) a closure associated with said slit, said closure comprising:

(i) two or more spaced apart first apertured members affixed to said cuff member at said first edge, said first apertured members having apertures aligned generally with said slit; and

(ii) a second apertured member interdigitated between two of said first apertured members and affixed to said cuff member at said second edge, said second apertured member having an aperture aligned generally with said slit

(c) retaining means for maintaining said closure closed with at least one said second apertured member interdigitated between said first apertured members.

5,487,757

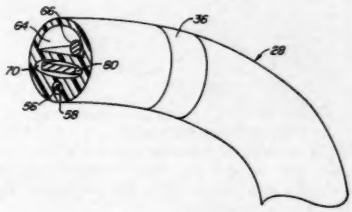
MULTICURVE DEFLECTABLE CATHETER

Csaba Truckai, Sunnyvale; Richard S. Jaraczewski, Livermore; Frank Nguyen, San Jose, and Scott H. West, Tracy, all of Calif., assignors to Medtronic CardioRhythm, San Jose, Calif.

Continuation of Ser. No. 95,447, Jul. 20, 1993, abandoned. This application Feb. 21, 1995, Ser. No. 391,333

Int. Cl.[6] A61N *1/05*

U.S. Cl. 607—122 **35 Claims**



34. A steerable electrophysiology catheter comprising:

a handle;

a shaft with a first bending stiffness, the shaft having a proximal end secured to the handle, a distal end, and an axial lumen therebetween;

a deflectable tip with a second bending stiffness less than the first bending stiffness, the deflectable tip having a proximal end secured to the distal end of the shaft, a distal end and an axial tip lumen in communication with the axial lumen of the shaft;

at least one electrode secured to the deflectable tip;

means for conducting current between the proximal end of the shaft and the electrode;

a manipulator wire extending through the axial lumen of the shaft and the tip lumen, the manipulator wire having a distal end secured to the distal end of the deflectable tip and a proximal end near the proximal end of the shaft;

an elongate, flexible stiffener element slidably disposed in the axial lumen of the shaft and the tip lumen, the stiffener element having a proximal end and a third bending stiffness;

means, coupled to the handle, for applying axial force to the manipulator wire to deflect the deflectable tip into a first curvature;

means, including a first slide axially slidable on the handle and secured to the proximal end of the stiffener wire, for axially moving the stiffener element relative to the deflectable tip such that at least a portion of the deflectable tip assumes a second curvature;

the handle including an outer surface, opposite which the first slide is positioned, and an inner surface; and

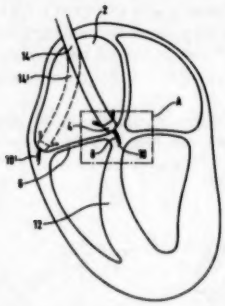
the stiffener element moving means including a ball and slider element secured to the first slide and positioned against the inner surface of the handle, the ball slider element having at least one low friction element in contact with the inner surface of the handle.

5,487,758

ELECTRODE SYSTEM FOR PACEMAKERS

Kurt Hoegnelid, Västerhaninge, and Alf Oehman, Vaellingby, both of, Sweden, assignors to Siemens-Elema AB, Solna, Sweden

Filed Sep. 22, 1993, Ser. No. 124,454
Claims priority, application Sweden, Sep. 28, 1992, 92027929
Int. Cl.[6] A61N *1/05*
U.S. Cl. 607—123 **13 Claims**



1. An electrode system for pacemakers, comprising:

ventricular electrode means for placement in contact with heart tissue in the ventricle for sensing electrical activity and for stimulating tissue, said ventricular electrode means including an insulated electrical conductor for transmitting signals to and from heat tissue;

said conductor terminating in an exposed, insulated tissue-penetrating terminal portion with an uninsulated tip insertable and anchorable in the atrial wall facing the septum, said terminal portion having a length proceeding into the region of the septum of superior part of the outer ventricular wall; and

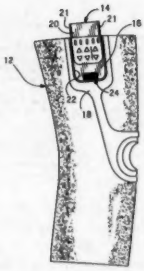
at least one atrial electrode means for placement in contact with heart tissue in the atrium for sensing electrical activity and stimulating tissue in the atrium, said atrial electrode means including a conductor for transmitting signals to and from tissue in the atrium, said conductor for said atrial electrode means and said conductor for said ventricular electrode means being disposed in a single cable having a cable end with said terminal portion of said ventricular electrode projecting from said electrode cable, and said atrial electrode means including an exposed electrode disposed at said cable end, said exposed electrode of said atrial electrode means and said terminal portion of said conductor of said ventricular electrode means being disposed relative to each other for causing said cable end and said exposed electrode of said atrial electrode means to be positioned in a lower part of the atrium when said terminal portion of said ventricular electrode means is disposed high up in the ventricle.

5,487,759

NERVE STIMULATING DEVICE AND ASSOCIATED SUPPORT DEVICE

Charles A. Bastyr, 12476 Rue Fountain Bleau, San Diego, Calif. 92131, and Paul T. Kolen, 7212 Linden Ter., Carlsbad, Calif. 92009

Filed Jun. 14, 1993, Ser. No. 77,349
Int. Cl.[6] A61N *1/18*
U.S. Cl. 607—149 **20 Claims**



1. An electrical stimulation system for applying a stimulation signal to a human user, said system comprising:

stimulation means for generating modulated electrical signals having a waveform of predetermined amplitude and therapeutic frequency;

support means removably attachable to a human user for carrying said stimulation means in proximity to said human user, said support means including a connection means for physically and electrically connecting said stimulation means to said support means;

a plurality of electrode pads of a predetermined size disposed on said support means so as to be positioned against the skin of said user when the support means is in position on the user; and

said connection means electrically connecting the stimulation means to the electrode pads when the stimulation means is connected to the support means;

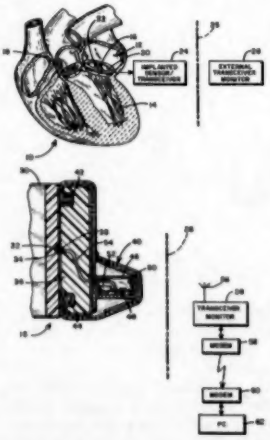
said connection means including a plurality of keyed connectors, the keyed connectors being configured to be representative of said size of the electrode pads, said stimulation means including a plurality of output connectors for engaging with said keyed connectors, said stimulation means including means for modifying the electrical signals in response to the configuration of the keyed connectors so as to match the impedance of said electrode pads.

5,487,760

HEART VALVE PROSTHESIS INCORPORATING ELECTRONIC SENSING, MONITORING AND/OR PACING CIRCUITRY

Manuel A. Villafana, Minneapolis, Minn., assignor to ATS Medical, Inc., Minneapolis, Minn.

Filed Mar. 8, 1994, Ser. No. 207,760
Int. Cl.[6] A61F *2/24*
U.S. Cl. 623—2 **20 Claims**



1. In combination, an artificial heart valve of the type having a tubular body member, defining a lumen and pivotally supporting at least one occluder, said body member having a sewing cuff covering an exterior surface of said body member; and an electronic sensor module disposed between said sewing cuff and said exterior

surface, wherein said sensor module incorporates a sensor element for detecting movement of said at least one occluder between an open and a closed disposition relative to said lumen and wherein said sensor module further includes a signal transceiver coupled to said sensor element, and means for energizing said signal transceiver, and wherein said sensor module includes means for encapsulating said sensor element, signal transceiver and energizing means in a moisture-impervious container.

5,487,761

PROCESS FOR DYEING PAPER WITH DISAZO DYES

Adolf Käser, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

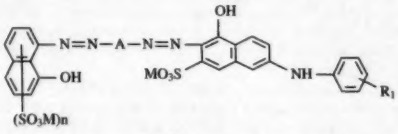
Filed Apr. 20, 1994, Ser. No. 230,264

Claims priority, application Switzerland, Apr. 29, 1993, 1303/93

Int. Cl.[6] C09B *31/00*

U.S. Cl. 8—527 4 Claims

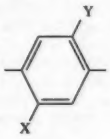
1. An aqueous solution of a dye having a pH of at least 11 which comprises 2 to 20 per cent by weight of a dye of the formula



(1)

and at least 0.1 mol of $Li^{\oplus}$ per mol of dye of the formula (1), in which

A is a radical of the formula



(2)

wherein

X is hydrogen, C_1–C_8-alkyl, C_5–C_8-cycloalkyl, C_1–C_4-alkoxy, or —NH—CO—Z,

Y is C_1–C_4-alkoxy which is unsubstituted or substituted by hydroxyl, C_1–C_4-alkoxy, sulfo, carboxyl, phenyl, phenoxy or phenylaminocarbonyl,

Z is hydrogen, C_1–C_8-alkyl, C_5–C_8-cycloalkyl, naphthyl, phenyl, C_1–C_4-alkoxy, mono- or dialkylamino, naphthylamino or phenylamino,

R_1 is hydrogen, C_1–C_8-alkyl, C_5–C_8-cycloalkyl, C_1–C_4-alkoxy, halogen, SO_3M or carboxyl,

M is hydrogen or one equivalent of a colorless cation, and

n is 1 or 2.

5,487,762

METHOD OF MINIMIZING DEPOSITS WHEN FIRING TIRE DERIVED FUELS

Rabindra K. Sinha, Coraopolis, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Feb. 1, 1995, Ser. No. 382,347

Int. Cl.[6] C10L *1/24*

U.S. Cl. 44—363 11 Claims

1. A method of minimizing deposit formation in a system firing tire derived fuels, comprising adding to said system an effective amount of a suspension comprising: (a) from about 45 to 50% by weight magnesium hydroxide ($Mg(OH)_2$) (b) from about 1 to 5% by weight organic dispersant selected from the group consisting of organic dispersants containing amino, sulfonyl and carboxylic groups; and (c) the balance water.

5,487,763

FUEL COMPOSITIONS

Iain More, Abingdon; Kenneth Lewtas; Jacqueline D. Bland, both of Wantage, and Sally J. Ayres, Stanton Harcourt, all of, United Kingdom, assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation of Ser. No. 71,905, Jun. 2, 1993, abandoned, which is a continuation of Ser. No. 539,586, Jun. 18, 1990, abandoned, which is a continuation of Ser. No. 356,749, May 24, 1989, abandoned, which is a continuation of Ser. No. 166,708, Mar. 11, 1988, abandoned. This application Feb. 23, 1995, Ser. No. 393,521

Claims priority, application United Kingdom, Mar. 12, 1987, 8705839

Int. Cl.[6] C10L *1/18*

U.S. Cl. 44—393 8 Claims

1. A fuel composition comprising a major proportion by weight of a distillate fuel oil boiling in the range of 120° C. to 500° C. and a minor proportion by weight of an additive combination for modifying the shape and structure of wax crystals comprising (A) a copolymer of (1) an alpha olefin having 12 to 17 carbon atoms per molecule or an aromatic substituted olefin having 8 to 40 carbon atoms per molecule, and (2) an ester, said ester being a mono- or dialkyl fumarate, itaconate, citraconate, mesaconate, trans- or cis-glutaconate, in which the alkyl group has 10 to 18 carbon atoms; and (B) a co-additive which is pour point depressant copolymer of ethylene and vinyl acetate having a Mn of from 1,000 to 6,000 wherein the vinyl acetate comprises about 20 to about 40 wt. % of the copolymer.

5,487,764

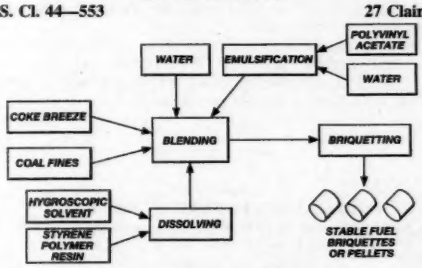
RECLAIMING AND UTILIZING DISCARDED AND NEWLY FORMED COKE BREEZE, COAL FINES, AND BLAST FURNACE REVERT MATERIALS, AND RELATED METHODS

George W. Ford, Jr., Salt Lake City, Utah, assignor to Covol Technologies, Inc., Lehi, Utah

Continuation of Ser. No. 184,099, Jan. 21, 1994, Pat. No. 5,453,103. This application Dec. 13, 1994, Ser. No. 354,693

Int. Cl.[6] C10L *5/02*

U.S. Cl. 44—553 27 Claims



1. A method of forming a solid blast furnace fuel product which does not risk generation or release of a hazardous substance, comprising the steps of;

(a) creating a water lean well mixed mixture of coke breeze and/or coal fines and water to form free carboxy ions on the surface of the carbon particles;

(b) dissolving styrene polymer resin in a hygroscopic solvent;

(c) combining the dissolved styrene resin in the water and coke breeze and/or coal fines mixture and well mixing the combination, to react the surface with the mixture of hygroscopic solvent and styrene to form free carbon ions by exchange of the styrene polymer resin in the hygroscopic solvent for water;

(d) emulsifying polyvinyl acetate in water, adding the emulsion to the combination of set (c) and well mixing the resultant to react the polyvinyl acetate with the styrene resin;

(e) subdividing the resultant of step (d) into segments and applying pressure to each segment to create hard, non-degradable solid fuel objects.

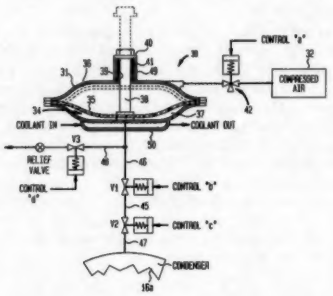
5,487,765
APPARATUS FOR PURGING NON-CONDENSABLE GASES FROM CONDENSERS

Alon Kedar, Nes Ziona, and Ohad Zimron, Rishon Lezion, both of, Israel, assignors to Ormat Turbines (1965) Ltd., Yavne, Israel

Continuation of Ser. No. 74,144, Jun. 9, 1993, abandoned, which is a continuation of Ser. No. 878,903, May 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 675,865, Mar. 27, 1991, Pat. No. 5,113,927. This application Jul. 13, 1994, Ser. No. 274,577

Int. Cl.[6] B01D *35/01*

U.S. Cl. 55—310 **39 Claims**



1. Apparatus for purging non-condensable gases from a source containing vaporized, condensable working fluid, said apparatus comprising:

a) an enclosed chamber located above a connection to said source;

b) a movable, flexible diaphragm in said chamber for dividing the latter into upper and lower portions;

c) two flow control valves serially connected together and located between the said connection and the lower portion of said chamber;

d) a venting valve connected to said lower portion;

e) each of said valves being selectively operable and having an open and a closed state;

f) means for moving said diaphragm in said chamber thereby changing the volume of said lower portion; and

g) means for synchronizing the states of the valves with changes in the volume of said lower portion.

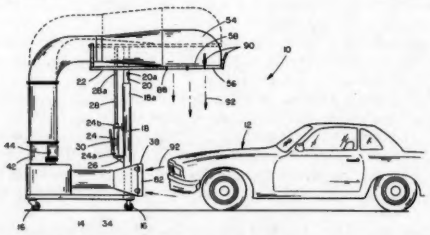
5,487,766
PORTABLE AIR FILTRATION APPARATUS

Mervin R. Vannier, 2145 S. 35th St., Omaha, Nebr. 68105

Filed May 24, 1994, Ser. No. 248,397

Int. Cl.[6] B01D *46/02*

U.S. Cl. 55—356 **9 Claims**



1. An air filtration apparatus comprising:

an intake duct having an intake opening in a forward end thereof;

a vertical pipe section having a lower end connected to a rearward end of the intake duct;

an exhaust duct having a rearward end connected to an upper end of said pipe section, and a forward end projecting forwardly from the rearward end;

an exhaust opening formed in a bottom surface of the exhaust duct forward end;

said intake duct, pipe section and exhaust duct forming an air flow passage from the intake opening to the exhaust opening;

a blower mounted in said air flow passage for moving air from the intake opening, through the air passage and out the exhaust opening;

a first particulate filter mounted in said intake opening;

a second particulate filter mounted in said exhaust opening; and

said pipe section including means for selectively adjusting the vertical length between the upper and lower ends of the pipe section, thereby selectively adjusting the location of the exhaust opening in a vertical direction relative to the intake opening, including:

said pipe section including a telescoping pipe section;

a vertically oriented length adjustable upright with an upper end connected to the exhaust duct and a lower end connected to the intake duct; and

means operably connected to the upright for selectively adjusting the length thereof;

said telescoping pipe section including:

an outer pipe having a lower end connected to the rearward end of the intake duct and extending upwardly therefrom to an upper end;

an inner pipe having an upper end connected to the rearward end of the exhaust duct and a lower end extending outwardly therefrom; said inner pipe telescoping within said outer pipe to form a length adjustable air passage therethrough.

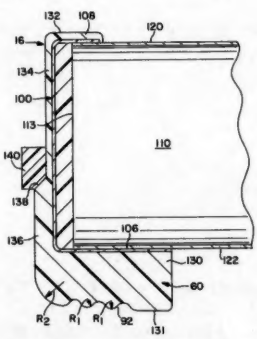
5,487,767
RADIALLY SEALED AIR FILTERS

Johnny M. Brown, Moore, Okla., assignor to Dana Corporation, Toledo, Ohio

Continuation of Ser. No. 129,393, Sep. 30, 1993, abandoned. This application Jan. 30, 1995, Ser. No. 380,316

Int. Cl.[6] B01D *46/00*

U.S. Cl. 55—357 **11 Claims**



1. In an annular filter comprised of an annular element of filtering material disposed between a pair of concentric screens, the annular filter element having radially extending first and second end faces and being suitable for mounting in a housing having a bottom and a cover with an axially extending annular projection extending therefrom into the housing, the improvement comprising:

a metallic end cap having a radially extending annular portion for fitting over the first end face of the filter element;

the metallic end cap further having a radially, inner, axially extending portion and a radially, outer, axially extending portion, each portion extending over one of the cylindrical screens;

a layer of adhesive disposed between the radially extending portion of the metallic end cap and the first end face of the filter element for bonding the metallic end cap to the filter element;

a seal of relatively vulcanized rubber material overlying the metallic end cap and being bonded thereto wherein the vulcanized rubber comprising the seal has a shore A hardness of about 35 to 50 durometer;

the seal having a radially disposed position with an axially facing outer end and axially facing inner end facing away from the outer end;

the radially disposed portion having a frustoconical surface proximate the inner end and a plurality of annular ribs proximate the outer end.

5,487,768

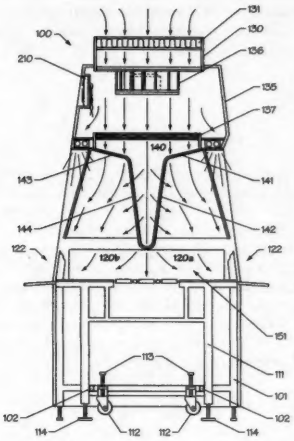
MINIENVIRONMENT FOR MATERIAL HANDLING

Donald J. Zytka, P.O. Box 666, Cascade, Colo. 80809; Peter G. Madden, 2190 Miller Dr., Longmont, Colo. 80501, and Robert B. Eglinton, P.O. Box 221695, Carmel, Calif. 93922

Filed Jan. 31, 1994, Ser. No. 189,416

Int. Cl.[6] B01D *46/00*

U.S. Cl. 55—385.2 **29 Claims**



1. An apparatus for providing a filtered-air environment for material handling comprising:

(a) a frame assembly, the frame assembly defining a material handling area within the frame assembly;

(b) a filtered-air delivery assembly for delivering filtered air to the material handling area, the filtered-air delivery assembly including:

(i) an air flow generator assembly for directing air to the material handling area from an area external to the material handling area, and

(ii) a filter assembly for filtering the air directed from the external area to the material handling area by the air flow generator assembly;

(c) an air flow redirector configured within the frame assembly for redirecting the air filtered by the filter assembly over the material handling area, the air flow redirector defining at least a pair of work space areas within the material handling area, each work space area having a separate opening for exposing each work space area to the external area such that material is handleable by a person or by a machine in each work space area from the external area through each work space's respective opening.

5,487,769

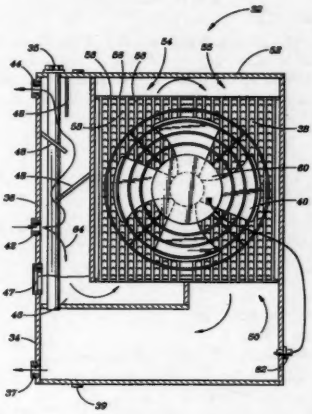
INTEGRAL APPARATUS FOR SEPARATING LUBRICANT FROM A HOT COMPRESSED GAS AND FOR COOLING THE SEPARATED LUBRICANT

William R. Hutchinson, and Daniel T. Martin, both of Clemmons, N.C., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Sep. 27, 1994, Ser. No. 313,496

Int. Cl.[6] B01D *45/00*

U.S. Cl. 55—442 **9 Claims**



9. A fluid system comprising:

a means for compressing a gas;

an integral separator and cooling apparatus for removing a lubricant from a heated, compressed lubricant and gas mixture, and for cooling the separated lubricant, the integral separator and cooling apparatus including,

(a) a cooling core having a first flow channel portion and a second flow channel portion;

(b) a receiving plenum mounted on the cooling core, the receiving plenum fluidly communicating with the first flow channel portion of the cooling core, the receiving plenum having a gas inlet for a heated, compressed lubricant and gas mixture, and a gas outlet for a heated, compressed gas;

(c) a means for precipitating a liquid lubricant from the heated, compressed lubricant and gas mixture, the liquid lubricant precipitating means being disposed within the receiving plenum;

(d) a lubricant reservoir mounted on the cooling core, the lubricant reservoir fluidly communicating with the second flow channel portion of the cooling core;

(e) a means for directing a flow of cooling fluid across the first and second flow channels;

(f) a thermal control means for controlling the cooling fluid directing means in response to the temperature of lubricant within the lubricant reservoir; and

a fluid powered device disposed in fluid receiving relation with the gas outlet of the receiving plenum.

5,487,770

DETECTION OF MARKED MINERAL OILS AND NOVEL AZO DYES

Rainer Dyllick-Brenzinger, Weinheim; Friedrich-Wilhelm Raulfs, Ludwigshafen; Ulrike Schlösser, Ludwigshafen; Karin H. Beck, Ludwigshafen, and Gerhard Scholz, Ludwigshafen, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

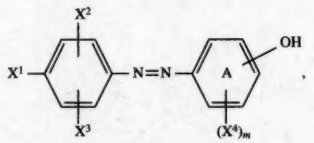
Filed Oct. 12, 1994, Ser. No. 321,629

Claims priority, application Germany, Jan. 12, 1993, 43 34 678.2

Int. Cl.[6] C10L *1/22*

U.S. Cl. 44—328 10 Claims

1. A method for detecting azo dye marked mineral oils by treating the marked mineral oil with an extractant comprising water, a solvent and a base, the azo dye transferring from the mineral oil into the aqueous phase, which comprises using as marker an azo dye of the formula I



(I)

where

ring A may be benzofused,

m is from 1 to 4,

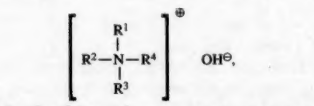
X^1 is hydrogen, C_1–C_4-alkyl, cyano or nitro,

X^2 is hydrogen, C_1–C_4-alkyl, cyano, nitro, C_1–C_4-alkoxy or C_1–C_{16}-alkoxycarbonyl,

X^3 is hydrogen, C_1–C_4-alkyl, cyano or C_1–C_{16}-alkoxycarbonyl, and

X^4 is hydrogen, hydroxyl, C_1–C_8-alkyl, which may be phenyl-substituted, C_1–C_4-alkoxy, amino, C_1–C_4-dialkylamino or C_1–C_{16}-monoalkylamino whose alkyl chain may be interrupted by from 1 to 3 oxygen atoms in the ether function,

as solvent a partially or completely water-miscible organic solvent, and as base an alkali or alkaline earth metal hydroxide, an alkali metal carbonate or an ammonium compound of the formula



(II)

where R^1, R^2, R^3 and R^4 are each independently of the others C_1–C_{16}-alkyl or benzyl.

5,487,771

HIGH-EFFICIENCY METAL MEMBRANE ELEMENT, FILTER, AND PROCESS FOR MAKING

Robert S. Zeller, Boston, Mass., assignor to Millipore Corporation, Bedford, Mass.

Continuation of Ser. No. 71,554, Jun. 4, 1993, abandoned. This application Jul. 27, 1994, Ser. No. 281,047

Int. Cl.[6] B01D *46/10;* C22C *1/04*

U.S. Cl. 55—523 19 Claims

1. A high-porosity metal filter comprising:

a membrane element formed by sintering a mass of dendritic metal particles in the absence of any extraneous material cohesively binding or supporting said dendritic particles forming said mass;

each of said metal particles having intertwined appendages and the intertwined appendages between adjacent sintered dendritic metal particles forming a matrix of substantially interconnected pores;

the porosity of said membrane element being defined by said intertwined appendages and being at least 55%.

5,487,772

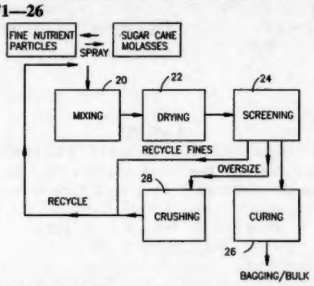
CARBOXYLATE NUTRIENTS AND METHODS FOR THEIR PRODUCTION AND USE

Paul E. McCoy, 255 Dolphin Point Rd., Unit 511, Clearwater, Fla. 34630

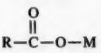
Continuation-in-part of Ser. No. 182,218, Jan. 14, 1994, abandoned, which is a continuation-in-part of Ser. No. 146,958, Nov. 3, 1993, Pat. No. 5,453,277, and a continuation-in-part of Ser. No. 776, Jan. 5, 1993, abandoned. This application Jan. 11, 1995, Ser. No. 371,352

Int. Cl.[6] A23K *1/175;* C05F *5/00*

U.S. Cl. 71—26 11 Claims



1. Method of supplying a cationic granular nutrient to a plant in a rapidly solubilizing form comprising applying to an area of plant growth an effective amount of a cationic granular nutrient containing at least 50% dry weight of a salt of saccharic acid of the formula:



wherein M is a nutrient cation selected from the group consisting of manganese, zinc, copper, iron, magnesium, boron, calcium and potassium and

R is a saccharide residue derived from molasses; the cationic granular nutrient being prepared by spraying a stoichiometric excess of a sugar cane molasses containing at least 76% by weight solids on a finely divided powdered oxide having the formula MO wherein M has the same meaning as set forth above; thereafter, drying in a rotary dryer at a temperature of 160° to 175° F. and curing for a sufficient time period to form the cationic granular nutrient.

5,487,773

PROCESS FOR PRODUCING SINTERED BODY AND MAGNET BASE

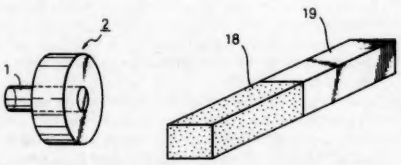
Yoshihiko Seyama, and Yutaka Shimizu, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 961,857, Oct. 16, 1992, Pat. No. 5,393,484. This application Oct. 4, 1994, Ser. No. 317,361

Claims priority, application Japan, Jan. 18, 1991, 3-269864

Int. Cl.[6] B22F *3/12;5/00*

U.S. Cl. 75—228 3 Claims



1. A magnetic base comprising:

a first portion, comprising one of a core portion or a core-containing peripheral portion, of an Fe-50% Co alloy; and

a second portion integral with the first portion and comprising a magnetic circuit-constituting portion of an Fe-Si alloy.

5,487,774

GAS PHASE FRACTIONATION METHOD USING POROUS CERAMIC MEMBRANE

Reid A. Peterson; Charles G. Hill, Jr., and Marc A. Anderson, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Nov. 8, 1993, Ser. No. 148,714
Int. Cl.[6] B01D *53/22*
U.S. Cl. 95—45 19 Claims

1. A method for using a porous ceramic membrane to fractionate individual gases from a mixture of gases, the mixture comprising molecules of a gas having a larger average molecular radius and molecules of a gas having a smaller average molecular radius, the method comprising the steps of:

providing a porous ceramic membrane comprising a metal oxide other than silica or alumina, the membrane having a mean pore diameter of less than about 40 Å;

passing the mixture of gases by the membrane at an average input pressure lower than one-half of the vapor pressure of the gas having the larger average molecular radius;

adsorbing preferentially the gas molecules having the larger average molecular radius within the membrane pores, thereby initiating non-Knudsen transport of the gas molecules having the larger average molecular radius in the pores; and

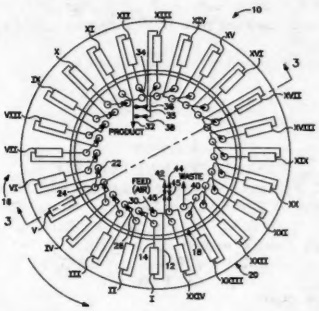
recovering a permeate stream enriched for gas molecules having the larger average molecular radius.

5,487,775

CONTINUOUS PRESSURE DIFFERENCE DRIVEN ADSORPTION PROCESS

Alberto LaCava, South Plainfield, N.J., and Kevin McKeigue, New York, N.Y., assignors to The BOC Group, Inc., New Providence, N.J.

Filed May 9, 1994, Ser. No. 240,048
Int. Cl.[6] B01D *53/047*
U.S. Cl. 95—98 15 Claims



1. A method of separating a multi-component gaseous mixture comprising:

passing the multi-component gaseous mixture through a first portion of an adsorbent at a sufficiently high pressure to adsorb at least one more preferentially adsorbed component of the multi-component gaseous mixture;

regenerating a second portion of said adsorbent at a sufficiently low partial pressure of said at least one more preferentially adsorbed component to desorb the at least one more preferentially adsorbed component from said adsorbent;

said multi-component gaseous mixture being passed through said first portion of the adsorbent and said second portion of said adsorbent being subjected to said sufficiently low partial pressure in discrete sections of said adsorbent making up said first and second portions of the adsorbent so that the sections forming said first portion of said adsorbent become successively less saturated with the at least one more preferentially adsorbed component as said multi-component mixture passes through said first portion of said adsorbent to form least and most saturated sections and so that the sections of adsorbent forming said second portion of the adsorbent become successively more concentrated in said at least one more preferentially adsorbed component to form regenerated and non-regenerated sections;

expelling a product stream enriched with at least one less preferentially adsorbed component of said multi-component mixture from said least saturated section; and

said second portion of said adsorbent being subjected to said sufficiently low partial pressure by introducing a purge stream, enriched with said at least one less preferentially adsorbed component of said multi-component mixture, to said regenerated section and such that purge stream is expelled as waste from said non-regenerated section;

continually and simultaneously shifting masses of said adsorbent between said first and second portions of said adsorbent so that the adsorbent forming said regenerated section is shifted to said first portion of said adsorbent and used to form said least saturated sections and so that the adsorbent forming said most saturated section is shifted to said second portion of said adsorbent and used to form said non-regenerated section;

the continual and simultaneous shifting of the masses of said adsorbent being made to occur at a sufficient frequency to maintain the sections forming the first and second portions of the adsorbent successively less saturated and successively more concentrated, respectively, in the more preferentially adsorbed components.

5,487,776

ANTI-FUNGAL NAIL LACQUER AND METHOD THEREFOR

Marcel Nimni, 2800 Neilson Way #908, Santa Monica, Calif. 90405

Filed Mar. 17, 1994, Ser. No. 210,220
Int. Cl.[6] A61K *7/043*
U.S. Cl. 106—18.35 14 Claims

1. An anti-fungal nail lacquer composition consisting essentially of an organic film former in solution in an organic solvent system therefor, a suspending agent, and an anti-fungal effective amount of griseofulvin, said organic film former forming a water permeable film containing the griseofulvin when the organic solvent system evaporates, wherein a portion of the griseofulvin is in solution and a portion of the griseofulvin is present as a colloidal suspension.

5,487,777

STABLE CMC SLURRY

Arvo O. Lundan; Ånaäs: Per-Håkan V., and Mikko J. Lähteenmäki, all of Äänekoski, Finland, assignors to Metsä-Serla Chemicals Oy, Äänekoski, Finland

PCT No. PCT/FI93/00132, § 371 Date Oct. 7, 1994, § 102(e) Date Oct. 7, 1994, PCT Pub. No. WO93/20139, PCT Pub. Date Oct. 14, 1993
PCT Filed Mar. 30, 1993, Ser. No. 284,628
Claims priority, application Finland, Mar. 31, 1992, 921413; Jul. 3, 1992, 923097
Int. Cl.[6] C09D *101/28*
U.S. Cl. 106—188 25 Claims

1. A carboxymethyl cellulose slurry which comprises:

(a) about 10 to 60%, based on the total weight of the slurry, of carboxymethyl cellulose,

(b) about 40 to 60%, based on the total weight of the slurry, of water soluble polyethylene glycol, the average molar mass of which is below about 1000 g/mol, and

(c) about 1 to 50%, calculated as a solid and based on the total weight of the slurry, of an inert powder or dispersion.

5,487,778

SURFACTANT COMPOSITION AND METHOD OF MAKING THE SAME

Richard J. Kaiser, Bethlehem, Pa., assignor to Binney & Smith Inc., Easton, Pa.

Division of Ser. No. 110,877, Aug. 24, 1993, abandoned, which is a division of Ser. No. 839,330, Feb. 20, 1992, Pat. No. 5,262,535. This application May 1, 1995, Ser. No. 432,277

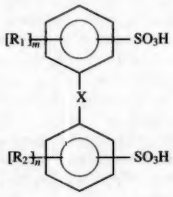
Int. Cl.[6] C09D 5/00;7/12

U.S. Cl. 106—287.23 9 Claims

1. An aqueous paint composition comprising:

(a) a water-based paint; and

(b) from about 10% to about 40% by weight of the reaction product of:



wherein X is a member selected from the group consisting of N, O and S; R_1 and R_2 are independently a straight or branched, saturated or unsaturated nonaromatic hydrocarbon of four to eighteen carbon atoms; m is 1 or 2; and n is 0, 1 or 2; and case is at the group for connection of this problem.

5,487,779

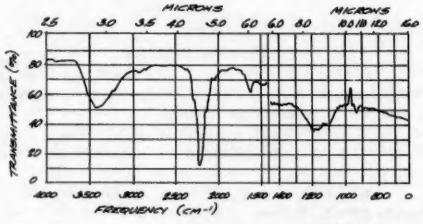
CORROSION INHIBITING PIGMENT COMPOSITION AND METHOD

John Sinko, Glendale, Wis., assignor to Wayne Pigment Corp., Milwaukee, Wis.

Filed Nov. 19, 1993, Ser. No. 155,586

Int. Cl.[6] C04B 14/36

U.S. Cl. 106—480 10 Claims



1. A method of preparing a (M)bis-hydrogen cyanamide composition with enhanced corrosion preventive activity, wherein M is a divalent metal selected from the group consisting of nickel, cobalt or mixtures thereof comprising

precipitating metal hydroxides selected from the group consisting of $Ni(OH)_2$, $Co(OH)_2$ or mixtures thereof, in situ in a liquid reaction medium, containing an excess of H_2NCN and immediately reacting the resultannt precipitate with said H_2NCN.

5,487,780

APPARATUS FOR APPLYING COATING MATERIALS TO OVERLAPPED INDIVIDUAL SHEETS

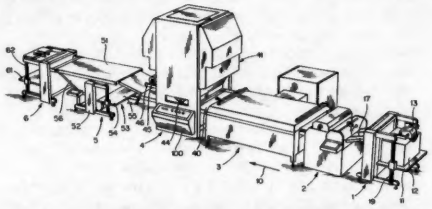
Johannes A. Ritter, Seeheim-Jugenheim, Germany, assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Feb. 15, 1994, Ser. No. 196,490

Claims priority, application Germany, Feb. 19, 1993, 43 05 081.6

Int. Cl.[6] B05C 1/00

U.S. Cl. 118—231 18 Claims



1. An apparatus for applying a coating material to a plurality of sheets as the sheets are conveyed past the apparatus, comprising:

(a) means for overlapping a plurality of sheets, such that a first minor portion of each sheet overlies a portion of a first adjacent sheet, and a second minor portion of each sheet underlies a portion of a second adjacent sheet wherein the first and second portions of each sheet are opposed portions of the sheet;

(b) a first coating station for applying a primer layer to a first major surface of each sheet, and a low adhesion backsize to a second major surface of each sheet;

(c) a second coating station comprising (i) means for receiving coating material from a supply of such material, (ii) means for at least partially drying the coating material on the receiving means and (iii) means for transferring the coating material from the receiving means to at least a portion of the primer coated first major surface of the overlapped sheets as the sheets are conveyed past the coating station to form coated sheets; and

(d) means for collecting the coated sheets.

5,487,781

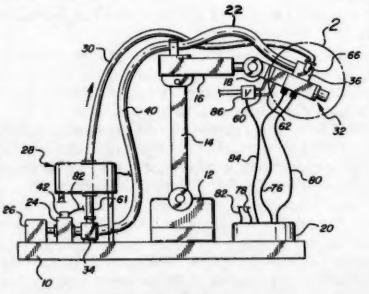
MASTIC APPLICATOR SYSTEM

Thomas J. Brennan, Rochester Hills; Michael E. DeFillipi, Grosse Pointe Park; Steven M. Gnyp, Grosse Pointe, and Gregory D. Kremer, Livonia, all of Mich., assignors to Johnstone Pump Company, Troy, Mich.

Filed May 17, 1994, Ser. No. 243,697

Int. Cl.[6] B05D 9/00

U.S. Cl. 118—300 17 Claims



1. A mastic applicator system including a conduit assembly including a mastic passage, an end member including a mastic passage in communication with the conduit assembly mastic passage, and a nozzle assembly including a nozzle outlet and a mastic

passage in communication with the end member mastic passage and the nozzle outlet, the improvement comprising:

a conditioning fluid passage Is provided in the conduit assembly proximate the conduit assembly mastic passage;

a further conditioning fluid passage is provided in the end member proximate the end member mastic passage;

a yet further conditioning fluid passage is provided in the nozzle assembly proximate the nozzle assembly mastic passage; and

the conditioning fluid passage of said conduit assembly, said end member, and said nozzle assembly are arranged in serial fashion so that a conditioning fluid may flow serially through the conduit assembly, end member, and nozzle assembly in proximity to the respective mastic passages so as to maintain a substantially constant mastic temperature in the entire mastic applicator system.

5,487,782

ELECTROSTATIC SPRAY COATING DEVICE FOR ELECTRICALLY CONDUCTIVE, NON-COMBUSTIBLE COATING FLUID

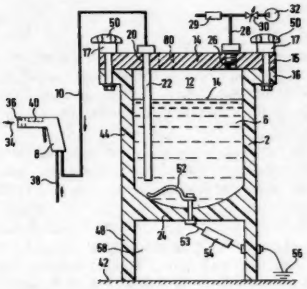
Kurt Seewaldt, Dietzenbach, Germany, assignor to ITW Oberflachentechnik GmbH, Dietzenbach, Germany

Filed Nov. 30, 1993, Ser. No. 159,677

Claims priority, application Germany, Dec. 1, 1992, 42 40 328.6

Int. Cl.[6] B05B *5/00*

U.S. Cl. 118—621 **10 Claims**



1. Electrostatic spray coating device for electrically conductive, non-combustible coating fluid, comprising: a pressure container (**2**) for the coating fluid (**5**), a spraying device (**8**) for atomizing and electrostatic charging of the coating fluid with high voltage, a tube (**10**) of electrically insulating material for feeding the coating fluid (**5**) from the pressure container (**2**) to the spraying device (**8**), at least one compressed air inlet (**26**) of electrically insulating material in the pressure container (**2**) above a maximal filling level (**4**) of the pressure container (**2**), at least one fluid outlet (**20**), which issues with spacing underneath the at least one compressed air inlet (**26**) into an interior of the container and to which there is connected the tube (**10**), the pressure container (**2**) formed of electrically insulating material which shields the high voltage of the electrically charged coating fluid (**6**) in the container (**2**) against the outside environment of the container (**2**), at least one grounding contact (**52**) is arranged in the container interior so that it is electrically connected with the coating fluid (**6**), an electric conduction path (**53**) is provided which connects the at least one grounding contact (**52**) for the electric discharge of the device and of the coating fluid with a ground potential (**56**) lying outside of the pressure container (**2**) electrically at least when the high voltage is switched off, the electric conduction path (**53**) having an electric resistor with a resistance in the range between the order of a mega ohm and a giga ohm and at least one separating switch which is automatically opened when the high voltage is switched-on, and wherein the separating switch is automatically closed when the high voltage is switched off.

5,487,783

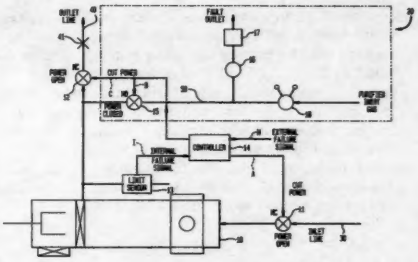
METHOD AND APPARATUS FOR PREVENTING RUPTURE AND CONTAMINATION OF AN ULTRA-CLEAN APCVD REACTOR DURING SHUTDOWN

Paul D. Agnello, Wappingers Falls, and Thomas O. Sedgwick, Croton-on-Hudson, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 14, 1994, Ser. No. 227,752

Int. Cl.[6] C23C *16/00*

U.S. Cl. 118—715 **10 Claims**



1. Apparatus for maintaining an optimum pressure and purity level in a vessel having an inlet gas flow and an outlet gas flow, during shutdown of the vessel to prevent imploding of the vessel when inlet and outlet gas flows are discontinued, comprising:

a. a reactant gas source for supplying said inlet gas flow to said vessel, and a separate source of purified inert gas;

b. containment means for containing said reactant gas from said vessel;

c. means for communicating said reactant gas from said vessel to said containment means and from said containment means to said vessel;

d. means for regulating the pressure of said containment means and said vessel;

e. means for backfilling said containment means only with said purified inert gas when said pressure of said containment means and said vessel drops to a lower level; and

f. means for venting said containment means when said pressure of said containment means and said vessel rises to a higher level.

5,487,784

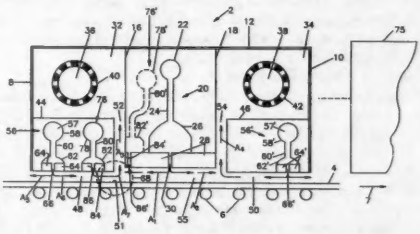
FORMATION OF TIN OXIDE FILMS ON GLASS SUBSTRATES

Frank B. Ellis, Jr., 42 Montadale Cir., Princeton, N.J. 08540

Division of Ser. No. 87,033, Jul. 6, 1993, Pat. No. 5,393,563, which is a continuation-in-part of Ser. No. 784,578, Oct. 29, 1991, abandoned. This application Nov. 22, 1994, Ser. No. 343,127

Int. Cl.[6] C23C *16/00*

U.S. Cl. 118—718 **18 Claims**



1. A deposition system for forming a metal oxide film on a substrate comprising:

means for defining an opening;

means for supplying reactants to said opening for forming said metal oxide film;
means for defining a first passageway that extends under and beyond either side of said opening, for supporting a substrate on which the metal oxide film is to be formed;
means for defining second and third passageways providing exhaust ducts that respectively meet said first passageway at junctions at opposite ends of said first passageway;
means defining a fourth passageway that extends from a source of ambient air to the junction of said first and second passageways;
means defining a fifth passageway that extends from ambient air to the junction of said first and third passageways;
transport means for moving said substrate progressively through said fourth, first, and fifth passageways, respectively;
means for controlling roughness of said film including means for injecting a dry gas into said fourth passageway so as to prevent ambient air from reaching the junction of said first, second, and fourth passageways; and
means for injecting a film growth inhibiting gas into said first passageway at a point between said opening, and the junction of said first, second and fourth passageways.

5,487,785

PLASMA TREATMENT APPARATUS

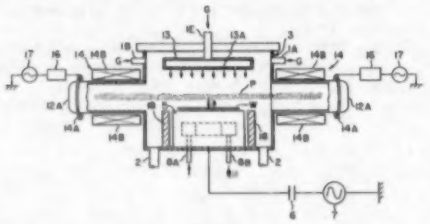
Yasuhiro Horiike, Hiroshima, and Takayuki Fukasawa, Yamanashi, both of, Japan, assignors to Tokyo Electron Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1994, Ser. No. 233,591

Claims priority, application Japan, Mar. 26, 1993, 5-092303; Mar. 26, 1993, 5-092304

Int. Cl.[6] C23C *16/00*

U.S. Cl. 118—723 E **20 Claims**



1. A plasma treatment apparatus comprising:
a processing vessel capable of being maintained at a degree of vacuum;
gas supply means for supplying a process gas into said processing vessel;
gas exhaust means for exhausting gases from within said processing vessel after treatment is completed;
plasma generation means provided in said processing vessel to generate radio-frequency waves within said processing vessel to cause generation of a plasma in said process gas; and
holder means provided in said processing vessel to hold an object to be subjected to treatment by said plasma, said object having a surface to be treated;
said gas supply means comprising;
a plurality of first gas supply means arranged equidistantly around a periphery of said processing vessel, said first gas supply means being provided to direct the process gas toward a center of said processing vessel and over said surface of the object; and
second gas supply means arranged at a center of an upper portion of said processing vessel to supply the process gas toward a central portion of the processing vessel and over said surface of the object;
said gas exhaust means comprising a plurality of gas exhaust structres arranged equidistantly around said periphery of said process vessel.

5,487,786

PLASMA CHEMICAL VAPOR DEPOSITION DEVICE CAPABLE OF SUPPRESSING GENERATION OF POLYSILANE POWDER

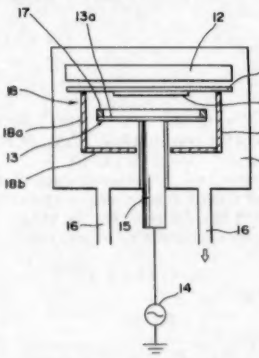
Atsushi Chida, Nara; Hitoshio Sannomiya, Osaka; Katsuhiko Nomoto, Kashiwara; Hiroshi Okamoto, and Yoshihiro Yamamoto, both of Nara, all of JP, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 22, 1994, Ser. No. 363,216

Claims priority, application Japan, Dec. 24, 1993, 5-326639; Aug. 4, 1994, 6-183265

Int. Cl.[6] C23C *16/00*

U.S. Cl. 118—723 E **5 Claims**



1. A plasma CVD device having within a deposition chamber:
a substrate holding electrode for holding a substrate;
a high frequency application electrode arranged opposite to and parallel to the substrate held by the substrate holding electrode;
a high frequency power supply for applying high frequency power to the high frequency application electrode; and
a substrate heater for heating the substrate held by the substrate holding electrode, wherein a material gas introduced between the substrate holding electrode and the high frequency application electrode is decomposed by glow discharge generated by a high frequency power applied between the two electrodes, so that a thin film is deposited on the heated substrate,
the plasma CVD device comprising:
a first electrode heater installed along a peripheral portion of the high frequency application electrode, and heating the peripheral portion of the high frequency application electrode; and
a second metallic electrode heater which is composed of a bottom portion and a side portion provided uprightly along a peripheral edge of the bottom portion and formed into a concave shape in section, and which surrounds the high frequency application electrode with a spacing therebetween, and which heats a surface of the high frequency application electrode opposite to its surface facing the substrate as well as the peripheral portion of the high frequency application electrode.

5,487,787

APPARATUS AND METHOD FOR PLASMA DEPOSITION

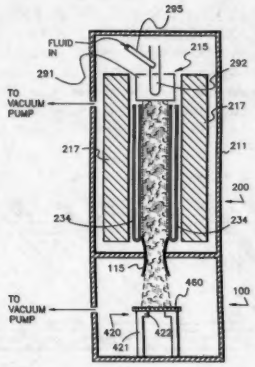
Gordon L. Cann; Cecil B. Shepard, Jr., both of Laguna Beach, and Frank X. McKevitt, Anaheim Hills, all of Calif., assignors to Celestech, Inc., Irvine, Calif.

Continuation of Ser. No. 3,573, Jan. 13, 1993, which is a division of Ser. No. 698,446, May 10, 1991, Pat. No. 5,204,144. This application Jan. 6, 1995, Ser. No. 369,427

Int. Cl.[6] C23C *16/00*

U.S. Cl. 118—723 R **2 Claims**

1. Apparatus for depositing a substance, comprising:



means for producing a plasma beam containing the constituents of said substance, said beam having a generally cylindrical elongated envelope and a longitudinal axis; and

a plurality of target substrates on which said substance is to be deposited, said substrates having surfaces generally along the envelope of the beam that are parallel to the longitudinal axis of said beam.

5,487,788

METHOD FOR CLEANING AND DISINFECTING CONTACT LENS

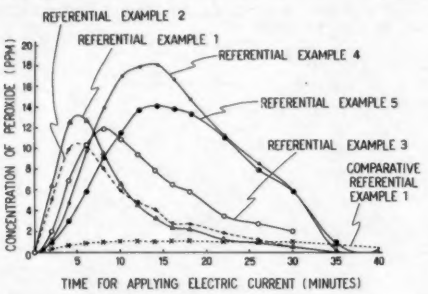
Hideaki Kamiya, Gifu; Satoshi Hashimoto, and Satoru Matumoto, both of Nagoya, all of, Japan, assignors to Tomei Sangyo Kabushiki Kaisha, Nagoya, Japan

Continuation-in-part of Ser. No. 41,203, Apr. 1, 1993. This application May 9, 1994, Ser. No. 239,887

Claims priority, application Japan, Apr. 3, 1992, 4-82215

Int. Cl.[6] B08B *3/10*

U.S. Cl. 134—1 **4 Claims**



1. A method for cleaning and disinfecting a contact lens comprising the steps of:

A. immersing a contact lens in a treating solution, which does not generate hypohalogenous acid salts, selected from the group consisting of boric acid salt buffer solution, phosphoric acid salt buffer solution, citric acid salt buffer solution, acetic acid salt buffer solution, oxalic acid salt buffer solution, succinic acid salt buffer solution, tartaric acid salt buffer solution, an aqueous solution containing a treating agent of which main components are boric acid and borax, Na_2SO_4 aqueous solution and admixture thereof,

B. applying a direct current to the treating solution with repeatedly reversing a positive electrode and a negative electrode of a pair of electrodes plural times so that the interval of time before reversing is different from the interval of time after reversing by at least 22.5 seconds and that the interval for reversing the positive electrode and the negative electrode is 0.1 second to 120 seconds, to generate hydrogen peroxide or ozone and raise the temperature of the treating solution to 50° to 100° C., and

C. bringing the contact lens into direct contact with bubbles generated on the electrodes.

5,487,789

PAINT STRIPPER

Johnny O. Sim, Alhambra, Calif., assignor to McGean-Rohco, Inc., Cleveland, Ohio

Continuation of Ser. No. 192,644, Feb. 7, 1994, Pat. No. 5,411,678. This application Nov. 9, 1994, Ser. No. 336,428

Int. Cl.[6] C11D *7/30*

U.S. Cl. 134—38 **8 Claims**

1. A method of stripping paint from a surface which comprises

(A) contacting the paint with a paint-stripper composition comprising

(A-1) from about 10% to about 80% by weight of at least one organic solvent selected from the group consisting of benzyl alcohol, alkyl-substituted benzyl alcohols, furfuryl alcohol, alkyl-substituted furfuryl alcohols and acetylenic alcohols containing from 3 to about 5 carbon atoms;

(A-2) from about 1% to about 20% by weight of pyrrole;

(A-3) from about 0.1% to about 8% by weight of at least one other organic amine compound as an activator; and

(A-4) water; in an amount and for a period of time sufficient to reduce the adhesion of the paint to the surface; and

(B) removing said paint and paint-stripper composition from said surface.

5,487,790

ELECTRIC POWER GENERATING ELEMENT

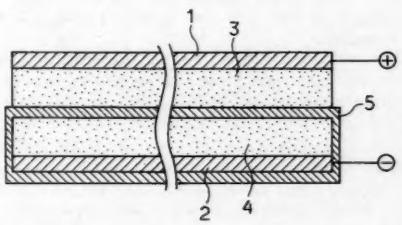
Shigeyuki Yasuda, c/o Tomonokai Research Laboratory 2-227, Kibuki-cho-kita, Kasugai-shi, Aichi-ken, Japan

Filed Nov. 25, 1992, Ser. No. 981,217

Claims priority, application Japan, Nov. 25, 1991, 3-336326; Mar. 9, 1992, 4-050655; Jul. 28, 1992, 4-201281

Int. Cl.[6] H01L *37/00*

U.S. Cl. 136—200 **7 Claims**



1. An electric power generating element converting heat energy to an electric energy, comprising:

a) a positive electrode;

b) a negative electrode formed from a metal;

c) a positive electrode composition provided on the surface of the positive electrode and comprising polyethylene glycol and graphite particles dispersed in the polyethylene glycol; and

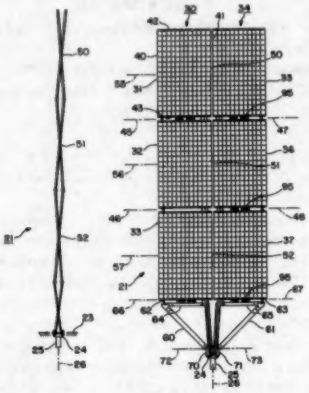
d) a negative electrode composition provided at a side of the negative electrode and comprising polyethylene glycol containing a salt providing an ionic conductivity.

5,487,791

STOWABLE AND SELF-DEPLOYABLE PARALLELOGRAM-TYPE PANEL ARRAY

Michael R. Everman; David M. Murphy, both of Santa Barbara, and James J. Wachholz, Goleta, all of Calif., assignors to AEC Able Engineering Co., Inc., Goleta, Calif.

Filed May 25, 1994, Ser. No. 249,125
Int. Cl.[6] H01L 31/045
U.S. Cl. 136—245 8 Claims



1. A stowable and self deployable parallelogram type panel array comprising:

a first set and a second set of rigid panels, each panel having a pair of parallel sides and a pair of parallel ends, said sets extending parallel to one another, on opposite sides of a central axis of the array;

a fold hinge joining the ends of adjacent panels in each set, each fold hinge mounting its respective panels to fold toward and away from each other along a fold axis, said fold axes being normal to a plane which includes the central axis;

pivot hinges rotationally connecting adjacent panels of the two sets at the mid-point of their adjacent sides for rotation around pivot axes which are parallel to the fold axes;

a base;

a first yoke and a second yoke journaled to said base for rotation around a respective yoke axis which is parallel to the hinge fold axes;

a first attachment hinge and a second attachment hinge respectively joining respective first and second yokes to an end of a panel in the first and second set, for rotation around a respective attachment axis which is parallel to the fold axes;

coordinating means interlinking said yokes whereby angular movement of one yoke is accompanied by an equal and opposite angular movement of the other yoke, said coordinating means comprising, a first gear and a second gear integral with said first and second yokes, respectively, and rotationally mounted to said base to journal said first and second yokes around said yoke axes, said gears having respective axes of rotation on said yoke axes, and also having identical teeth meshed together to coordinate the rotation of said yokes, the said axes of rotation being on opposite sides of said central axis from their respective set of panels when viewed in a plane normal to said hinge fold axes; and

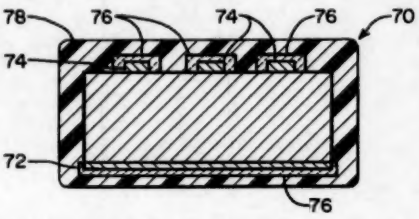
power means in each fold hinge biasing adjacent panels toward their deployed condition, said power means constituting the only source of force for deployment of the array.

5,487,792

MOLECULAR ASSEMBLIES AS PROTECTIVE BARRIERS AND ADHESION PROMOTION INTERLAYER

David E. King, Lakewood; Alvin W. Czanderna, Denver, and Cheryl E. Kennedy, Lafayette, all of Colo., assignors to Midwest Research Institute, Kansas City, Mo.

Filed Jun. 13, 1994, Ser. No. 258,984
Int. Cl.[6] H01L 31/04;31/048;31/0216;31/0224
U.S. Cl. 136—256 12 Claims



1. An article having a metal surface, comprising:

a diffusion barrier comprising an agent having the general formula HS—$(CH_2)_{11}$—COOH deposited on said metal surface.

5,487,793

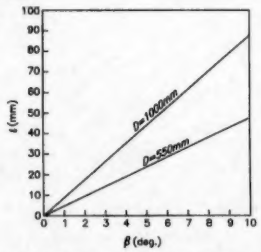
Patent Not Issued For This Number

5,487,794

METHOD OF PRODUCING CRYSTAL BODIES HAVING CONTROLLED CRYSTALLINE ORIENTATION

Hiromi Mitsunori, and Toshio Sadayori, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Japan

Continuation of Ser. No. 904,520, Jun. 25, 1992, abandoned, which is a division of Ser. No. 499,442, Jun. 21, 1990, Pat. No. 5,205,872. This application May 17, 1994, Ser. No. 245,231
Claims priority, application Japan, Dec. 10, 1988, 63-311024; Dec. 10, 1988, 63-311025
Int. Cl.[6] C21D 8/12; C30B 28/02
U.S. Cl. 148—111 4 Claims



4. In a method of producing bi-directionally oriented electromagnetic steel sheets, having improved magnetic properties, wherein said steel sheets are prepared by hot rolling a slab of silicon-containing steel sheet treating material, rendering said hot rolled sheet into a final thickness, and then subjecting said rendered sheet to primary recrystallization annealing and finish annealing, a magnetic property improvement step consisting essentially of:

selecting a coil-like steel sheet as said treating material;

selecting a seed material having a crystal structure a) the same as said treating material or b) which differs from said crystal structure of said treating material by having interstitial or substitutional elements present in amounts such that the crystal lattices of said seed material and said treating material differ by 30% or less, wherein said seed material has said

crystalline orientation at a state of energy lower than that of said treating material;

abutting and joining a surface of said seed material having a desired crystalline orientation against a coiled end face of said coil-like steel sheet, said abutting being performed between the steps of hot rolling and finish annealing, according to the following orientation relationships:

$$|\alpha| \leqq 10°$$

$$|\beta| \leqq 10°$$

where

α is the angle defined by the projection line of the <001> axis of said seed material with respect to the rolling face of said steel sheet and the rolling direction of said steel sheet; and

β is the inclination angle of the {100} face of said seed material with respect to said rolling face of said steel sheet.

heating to a temperature not lower than the recrystallization temperature of said seed material to cause grain boundary movement and causing said desired crystalline orientation of said seed material to grow and project said desired crystalline orientation of said seed material over the whole of said steel sheet.

5,487,795

METHOD FOR HEAT TREATING AN IMPACT BEAM OF AUTOMOTIVE VEHICLE DOOR AND A SYSTEM OF THE SAME

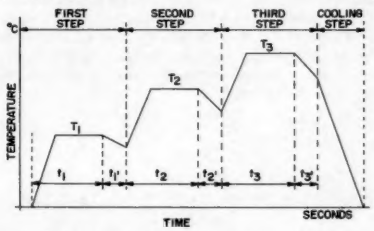
Jong-Kyu Kim, and Jin-Suk Lee, both of Kyungbuk, Rep. of Korea, assignors to Dong Won Metal Ind. Co., Ltd., Rep. of Korea

Filed Jul. 1, 1994, Ser. No. 269,483

Claims priority, application Rep. of Korea, Jul. 2, 1993, 93-12358; Apr. 27, 1994, 94-8904

Int. Cl.[6] C21D *9/00*

U.S. Cl. 148—520 **2 Claims**



1. A method for heat treating an impact beam of an automotive vehicle door exhibiting high tensile strength, yield strength and elongation, comprising the steps of:

preparing hot rolled steel sheets consisting essentially of 0.18 % to 0.22% carbon; 1.0 to 1.5% manganese; 0.15 to 0.4% silicon; not more than 0.025% phosphorous; not more than 0.008% nitrogen; not more than 0.0010% sulfur; 0.01 to 0.04% aluminum; 0.001 to 0.003% boron; 0.1 to 0.3% chromium; 0.01 to 0.035% titanium; and the balance essentially consisting of iron;

roll-forming and welding the steel sheets to make a tube-shaped impact beam;

carrying out a heat treatment including three steps of high frequency induction heating and air cooling the impact beam consecutively; and

carrying out quenching of water cooling said heat treated and air cooled impact beam;

wherein said heat treatment step includes the steps of:

first high frequency induction heating said impact beam for 0.83 to 2.5 seconds at 500° to 720° C. and air cooling said beam for 0.27 to 1 second;

second high frequency induction heating said impact beam first heat treated for 0.83 to 2.5 seconds at 750° to 850° C. and air cooling said beam for 0.27 to 2 seconds; and

third high frequency induction heating said impact beam second heat-treated for 0.83 to 2.5 seconds at 830° to 960° C. and air cooling said beam for 1.5 to 5 seconds.

5,487,796

METHOD OF QUENCHING METALS

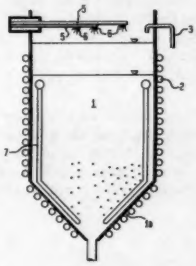
Sorayapour Soraya, Kurt-Schumacher-Allee 84, 66740 Saarlouis, Germany

Filed Apr. 5, 1995, Ser. No. 417,377

Claims priority, application Germany, Nov. 15, 1994, 44 40 777.7

Int. Cl.[6] C21D *1/60*

U.S. Cl. 148—633 **10 Claims**



1. A method of quenching metals, comprising the steps of quenching said metal in a boiling aqueous solution comprising sodium tetraborate between 20 and 50% by weight and introducing a gas to the solution for compensating losses of components of the solution and preconditioning pollutants in the solution for their subsequent removal.

5,487,797

PROCESS FOR THE MANUFACTURE OF A FLAT PRODUCT OF ZIRCONOUM ALLOY OR HAFNIUM ALLOY COMPRISING A CONTINUATION OF HOT ROLLING AFTER INFRARED REHEATING, AND ITS UTILIZATIONS

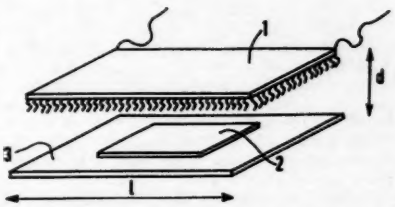
Gerard Dumas, Albertville; Pierre Barberis, Ugine, and Gerard Bunel, Echauffour, all of, France, assignors to Cezus Compagnie Europeenne du Zirconium, Courbevoie, France

Filed Mar. 2, 1995, Ser. No. 398,006

Claims priority, application France, Mar. 2, 1994, 94 02613

Int. Cl.[6] C22F *1/18*

U.S. Cl. 148—672 **14 Claims**



1. In a process for manufacturing a sheet, band or strip of zirconium alloy or hafnium alloy comprising the steps of:

hot roughing an ingot into a blank;

hot rolling the blank in the alpha temperature range comprising a plurality of hot rolling passes and at least one reheating in a furnace between said hot rolling passes, and including at least an initial hot rolling pass and a final hot rolling pass following a furnace reheating, to form a hot rolled blank of predetermined thickness; and

cold rolling the hot rolled blank including at least one cycle of rolling pinch passing followed by heat treatment;

the improvement comprising subjecting the hot rolled blank, before said cold rolling, to infrared reheating with a wave length between 0.8 and 5 micrometers, to increase the temperature of the hot rolled blank by at least 100° C. at a rate of at least 4° C./s, and continuing hot rolling until the blank has a thickness less than or equal to 0.8 times said predetermined thickness, said continuing including a plurality of hot rolling passes with at least one infrared reheating therebetween.

5,487,798

HIGH VELOCITY GUN PROPELLANT

Laurence O. Williams, Orlando, Fla., assignor to Martin Marietta Corporation, Bethesda, Md.

Continuation of Ser. No. 492,954, Mar. 13, 1990, abandoned. This application Jul. 2, 1992, Ser. No. 911,537

Int. Cl.[6] C06B *43/00;35/00*

U.S. Cl. 149—22 **12 Claims**

1. A propellant composition consisting essentially of ammonium azide, and a second material which is a metal, metal hydride, silicon or mixtures thereof wherein the ratio of ammonium azide to the second material is selected such that, upon reaction, the propellant forms a solid nitride and a gas phase which is substantially pure hydrogen.

5,487,799

METHOD OF PREVENTING FIRE IN SHIP ENGINE ROOM BY WRAPPING PROTECTED AREA WITH A LAMINATED MATERIAL

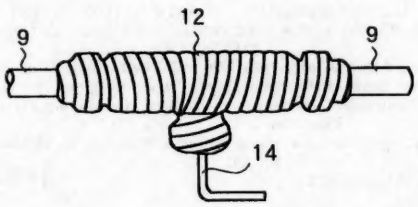
Ken Tsukada, Tokyo, Japan, assignor to Tokyo Nisshin Jahara Co., Ltd., Tokyo, Japan

Filed May 11, 1994, Ser. No. 241,410

Claims priority, application Japan, May 25, 1993, 5-145688

Int. Cl.[6] E04B *2/00;* **B32B** *31/00;* **B27N** *9/00;* **B63B** *17/00*

U.S. Cl. 156—71 **7 Claims**



1. A method of preventing fire in an engine room of a ship comprising the steps of:

providing a laminated material consisting of an aramid fabric base layer having an aluminum foil bonded to each surface thereof and a separable layer covering an adhesive on one of the aluminum foil covered surfaces;

identifying a portion of the engine room from which a flammable liquid is likely to spout;

cutting out the laminated material to obtain a laminated tape;

removing the separable layer from the laminated tape to expose the adhesive; and

winding the laminated tape round the identified portion so that the exposed adhesive will adhere to one of the identified portion and the wound laminated tape and seal the identified portion so that the flammable liquid will not spout therefrom, whereby fire is prevented by stopping the flammable liquid from spouting and igniting when the liquid settles on a heated surface of the engine room.

5,487,800

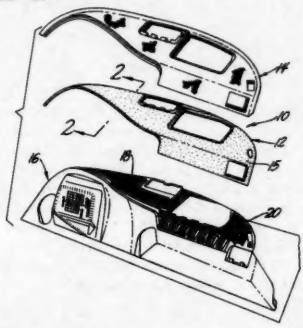
METHOD OF MAKING A COVERED ARTICLE BY VACUUM DRAWING

Robert A. Ash, Baltimore, Canada, assignor to Davidson Textron Inc., Dover, N.H.

Filed Jan. 24, 1994, Ser. No. 185,127

Int. Cl.[6] B32B *31/04;31/12;31/20*

U.S. Cl. 156—87 **24 Claims**



1. A method of making a covered article having a substrate and a cover comprising:

providing a substrate having a front surface to be covered, a back surface and a plurality of holes extending through it from the front surface to the back surface for vacuum drawing a cover against the front surface of the substrate,

providing fluid passages at the back surface in a peripheral margin adjacent an edge of the substrate to be wrapped by the cover,

supporting the substrate on a vacuum buck so that the peripheral margin of the back surface overhangs the vacuum buck and the fluid passages communicate with a vacuum source of the buck, and

forming a cover stock against the front surface of the substrate and a marginal portion of the cover stock against the peripheral margin of the back surface by pressure differential and with an adhesive disposed therebetween to provide a cover stock that is wrapped around the edge of the substrate and adhered to the substrate.

5,487,801

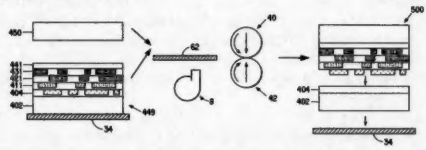
PRE-PROOF TEMPERATURE CONTROLLING ASSEMBLY

Michael P. Marion, Wallingford, and David C. Otto, Kennett Square, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 110,458, Aug. 23, 1993, abandoned. This application Nov. 23, 1994, Ser. No. 344,756

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—64 **5 Claims**



1. An off-press method for laminating a first precolored image photosensitive element to an image receiving substrate supported on a carrier plate and then transferring the color image from the receiving substrate to a transfer sheet to form a proof, comprising:

exposing the first precolored photosensitive element comprising a first aqueously developable precolored photosensitive layer on a first removable support through a first color separation transparency forming first image areas and first non-image areas in the first aqueously developable precolored layer;

processing the exposed first element to develop a first color image by washing away the first non-image areas with water;

stacking the first image bearing element in registration on the substrate on the carrier plate on a sheet preparation and feed table of a laminator;

sliding the stacked first image bearing element, substrate and carrier plate along a tray into a nip between a pair of rollers heated to about a temperature T1 and which are parallel or substantially parallel;

laminating the stacked first image bearing element to the substrate by transporting the first image bearing element on the substrate and the carrier plate through a pair of heated rollers;

during the sliding and laminating steps, cooling the tray and the first image bearing element, substrate and carrier plate on the tray to about a temperature T3 above room temperature and below the temperature T1;

peeling the removable support from the first image bearing element resulting in a modified first image bearing element;

stacking a transfer sheet on the modified first image bearing element on the carrier plate on the sheet preparation and feed table of the laminator;

sliding the stacked transfer sheet, modified first image bearing element, and carrier plate along the tray into the nip between the pair of rollers heated to about the temperature T1 and which are parallel or substantially parallel;

laminating the transfer sheet to the first image bearing element through the pair of heated rollers; and

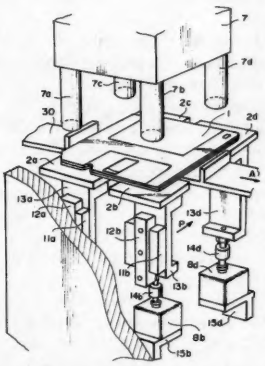
during the second sliding and second laminating steps, cooling the tray and the first image bearing element, transfer sheet and carrier plate on the tray to about the temperature T3 above room temperature and below the first temperature.

5,487,802

ULTRASONIC WELDING METHOD AND APPARATUS FOR MOLDED RESIN MATERIALS

Akira Mizuta, and Fumio Yamazaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 31, 1991, Ser. No. 815,160
Claims priority, application Japan, Jan. 9, 1991, 3-001044
Int. Cl.[6] B32B *31/16*
U.S. Cl. 156—73.1 **10 Claims**



1. An ultrasonic welding method for molded resin materials, comprising:

superimposing one upon the other corresponding parts of molded resin materials to be welded together;

holding the superimposed molded resin materials between a welding horn and a molded material receiving section;

supporting a plurality of section parts of said molded material receiving section independently of each other by a plurality of molded material receiving section support members;

associating with each of said section parts only a single different one of a plurality of fluid-pressure cylinders;

welding the corresponding parts of the molded resin materials together by said welding horn; and

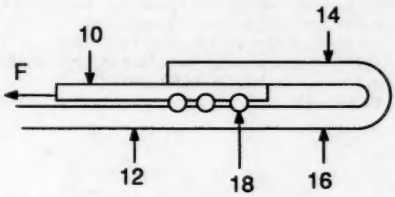
as said corresponding parts of said molded resin materials are welded together, adjusting supporting forces of the plurality of said molded material receiving section support members independently of each other, by individually regulating the fluid pressure applied by said welding horn onto each pair of said corresponding parts of said molded resin materials is equal to a predetermined value.

5,487,803

METHOD FOR OBTAINING MECHANICAL LOCK BETWEEN SURFACES

Eugene J. Sweeney, Plymouth, and Gregory A. Pelts, Novi, both of Mich., assignors to Lord Corporation, Cary, N.C.

Continuation of Ser. No. 67,501, May 25, 1983, abandoned. This application May 18, 1995, Ser. No. 443,988
Int. Cl.[6] B32B *7/08;7/12;* **F16B** *11/00*
U.S. Cl. 156—91 **23 Claims**



1. A method of forming a hem flange assembly, comprising the steps of:

(a) positioning a first panel adjacent to, but not contacting, a second panel such that an edge of the second panel extends beyond an edge of the first panel;

(b) providing spherical particulate granules and an adhesive between the overlapping portion of the two panels wherein the spherical particulate granules have a compressive strength that is greater than the respective yield strength of each of the two panels;

(c) folding the non-overlapping portion of the second panel over the edge of the first panel;

(d) applying pressure of 3,500 to 11,000 psi to the overlapping portion of the panels so that the panels move toward each other to a point where they remain a spaced distance apart and a substantial number of the spherical particulate granules are embedded in both of the panels, such that the pressure necessary to shift the first panel with respect to the second panel requires a shifting force greater than about 50 psi resulting in a temporary mechanical lock between the panels; and

(e) curing the adhesive to obtain a final lock between the panels and form the hem flange assembly.

5,487,804

METHOD ALLOWING THE INCORPORATION OF A METALLIC STRUCTURE INTO A PLASTIC

Bruno Thevenet, Lyons, and Denis Gille, Bellignat, both of, France, assignors to PROTECMA, France

PCT No. PCT/FR93/00385, § 371 Date Dec. 15, 1993, § 102(e) Date Dec. 15, 1993, PCT Pub. No. WO93/21367, PCT Pub. Date Oct. 28, 1993
PCT Filed Apr. 20, 1993, Ser. No. 167,885
Int. Cl.[6] B32B *31/00*
U.S. Cl. 156—148 **11 Claims**

1. A method of producing a molded article having electromagnetic and electrostatic properties that includes the steps of

providing a conductive metal yarn having a rectangular cross section such that the width of the yarn is about between 300 and 500 times its thickness;

providing a thermoplastic yarn;

knitting both yarns together into a plaited pattern on the same weft knitting machine to form a composite fabric wherein the metal yarn forms about 5% to 10% by weight of the composite fabric, said fabric being highly deformable in all directions, and said fabric having a top face and a bottom face such that one face primarily consists of metal yarn and the other face primarily consists of thermoplastic yarn;

heat forming a sheet of plastic;

calendering the fabric with the plastic sheet while the sheet is still in a heated state to at least partially implant one face of the fabric into a surface of said sheet, and

molding the fabric implanted sheet into an article having a complex shape whereby the deformable fabric faithfully follows the contour of the complex shaped article.

5,487,805

METHOD AND A DEVICE FOR THE AUTOMATIC SPLICING OF STRIPS DECOILED FROM ROLLS

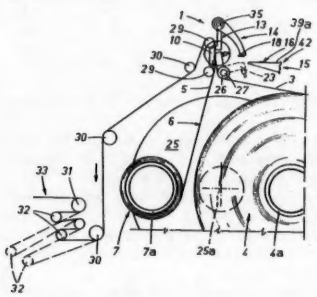
Silvano Boriani, and Antonio Gamberini, both of Bologna, Italy, assignors to G.D S.p.A., Bologna, Italy

Filed Mar. 24, 1994, Ser. No. 216,845

Claims priority, application Italy, Mar. 25, 1993, BO93A0112

Int. Cl.[6] B65H *21/00*

U.S. Cl. 156—159 **11 Claims**



1. A device for automatically splicing strips decoiled from rolls of material, comprising:

a fixed reference surface over which a depleting strip can be advanced;

a movable restraint assembly capable of movement between first position in which the restraint assembly is spaced from the fixed reference surface and a second position in which the restraint assembly is moved into engagement with said fixed reference surface so as to hold a trailing portion of the depleting strip motionless therebetween;

a cutting assembly capable of movement to effect a transverse cut through the trailing portion of the depleting strip as the depleting strip is held motionless between the fixed reference surface and the restraint means so as to form a cut end of the trailing portion of said depleting strip;

a movable retaining assembly capable of transferring a leading portion of a new strip of material from a position in which the leading portion is spaced from the trailing portion of said depleting strip to a position in which the leading portion is forced into engagement with said trailing portion adjacent said cut end; and

a securing assembly for providing a securing material between said leading portion of said new strip and said trailing portion of said depleting strip so that said leading portion and said trailing portion are secured to one another after being brought into engagement by said retaining assembly .

5,487,806

METHOD FOR EMBODYING A FLEXIBLE TUBULAR ELEMENT IMPREGNATED WITH RESIN TO BE SUBSEQUENTLY MOULDED

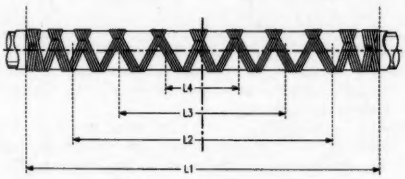
Paul-Henri Viellard, 22 rue Spontini, F75116 Paris, France

Continuation-in-part of Ser. No. 762,528, Aug. 8, 1991, abandoned. This application Jun. 18, 1993, Ser. No. 77,899

Claims priority, application France, Aug. 8, 1990, 90 10108; Dec. 5, 1990, 90 15225; Dec. 5, 1990, 90 15226; Jan. 21, 1991, 91 00609

Int. Cl.[6] A63B *49/10*; B65H *81/00*

U.S. Cl. 156—175 **5 Claims**



1. A method for embodying for subsequent moulding operation a tubular flexible element impregnated with resin, for realizing a tennis racket frame, which comprises the following steps:

(a) impregnating reinforcing fibers with resin;

(b) winding said impregnated reinforcing fibers around a tubular flexible sheath placed onto a rigid rotary-driven mandrel having a longitudinal axis, so that at least one additional winding of said reinforcing fibers is wound over a different length and according to a pitch which varies during winding operation of the additional winding, to obtain a tubular flexible element to be molded of which anisotrophy is controlled;

said tubular flexible element having a length comprised between 1200 and 1800 mm;

the impregnated reinforcing fibers winding laid over the flexible sheath having a total weight comprised between 150 and 250 g.; and

the impregnated fibers winding being laid over with angles contained between 18 degrees and 42 degrees with relation to the mandrel longitudinal axis;

said impregnated fibers winding comprising;

a first winding performed over a first length of the tubular flexible element and having a weight contained between 58% and 70% of the total weight;

a second winding performed over a second length, symmetrical to a middle of the first length of the tubular flexible element, comprised between 72% and 85% of the first length, the said second winding having a weight comprised between 12% and 26% of the total weight;

a third winding performed over a third length, symmetrical to the middle of the first length of the tubular flexible element, contained between 50and 62% of the first length, the said third winding having a weight comprised between 8% to 20% of the total weight;

and a fourth winding performed over a fourth length, symmetrical to the middle of the first length of the tubular flexible element, comprised between 16% and 33% of the first length, the said fourth winding having a weight comprised between 2% and 8% of the total weight; and

(c) separating said tubular flexible element from the mandrel and performing molding thereof.

5,487,807

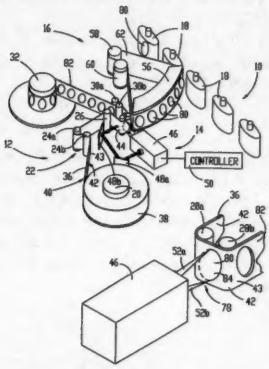
SYSTEM FOR PRODUCING LABELS FROM A WEB

Grâydon W. Nedblake, Kansas City, and John Garber, Fenton, both of Mo., assignors to Greydon W. Nedblake, Kansas City, Mo.

Continuation of Ser. No. 996,089, Dec. 23, 1992, Pat. No. 5,421,933. This application Dec. 27, 1994, Ser. No. 364,743

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—353 **24 Claims**



1. An apparatus for labeling objects comprising:

dispensing means for continuously dispensing an elongated web of label material without a carrier sheet from a supply thereof, said web presenting a plurality of label bodies surrounded by respective label boundaries;

a laser unit including laser means for producing a plurality of laser beams for cutting through said web, and

control means for controlling said laser beams so that said laser beams cut through said web along divergent paths of each of said label boundaries for separating said label bodies from said web in continuous succession; and

an application assembly including support means other than said web for supporting said label bodies before and after separation from said web,

transport means for transporting said label bodies away from said web in continuous succession toward objects to be labeled, and

applying means for applying said labels in continuous succession to a respective plurality of the objects thereby labeling the objects.

13. An apparatus for producing labels comprising:

dispensing means for dispensing an elongated web of label material from a supply thereof, said web presenting a plurality of label portions distributed along the length of said web and surrounded by respective label boundaries; and

a laser unit including laser means for producing a plurality of laser beams for cutting through said web, said dispensing means including means for passing said label portions in succession in the path of said laser beams, said laser unit further including control means for controlling said laser beams, said control means including electronic memory means for storing information representative of said boundaries, and

a controller for retrieving said information from said memory means and for controlling said laser beams in accordance with said information so that, for each of said label portions, said laser beams cut completely around said label portion along said boundary thereof before cutting the boundary of a successive label portion and so that said laser beams cut through said web along divergent paths of each of said label boundaries for separating said label portions from said web to produce corresponding labels in succession and a web matrix.

20. An apparatus for producing labels comprising:

dispensing means for dispensing an elongated web of label material from a supply thereof, said web presenting a plurality of label portions longitudinally distributed along said web, said label portions being surrounded by respective label boundaries; and

a laser unit including laser means for producing a laser beam for cutting through said web,

said dispensing means including means for passing said label portions successively in the path of said laser beam,

said laser unit further including control means for controlling said laser beam, said control means including

electronic memory means for storing information representative of said boundaries, and

a controller for retrieving said information from said memory means and for controlling said laser beam in accordance with said information so that, for each of said label portions, said laser beam cuts completely around said label portion along said boundary thereof before cutting the boundary of a successive label portion.

5,487,808

APPARATUS FOR LAMINATING PLATES

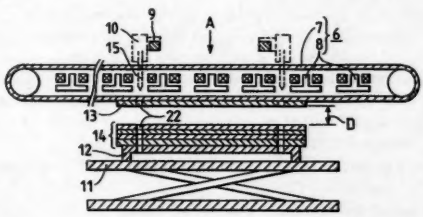
Isao Suzuki; Masuo Shindo, and Kiyoshi Nakao, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 152,007, Nov. 15, 1993, abandoned. This application Feb. 9, 1994, Ser. No. 195,134

Claims priority, application Japan, Nov. 16, 1992, 4-304208; Feb. 16, 1993, 5-025868

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—556 **9 Claims**



1. An apparatus for laminating plates in an aligned position, each plate defining at least two guide holes, comprising:

a horizontal base for receiving a stack of said plates;

conveying means for conveying said plates to an elevated predetermined position overlying said horizontal base, one by one, said conveying means dropping said plates from said predetermined position onto said horizontal base to laminate said plates to each other; and

guide means including at least two guides pins overlying said conveying means in an elevated initial position and oriented to be perpendicular to a conveyed plate at said predetermined position, said guide means moving said guide pins down

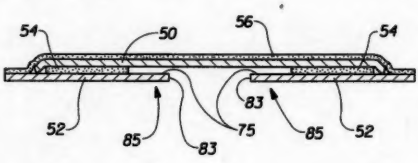
wardly from said initial position with a dropping plate to remain in said guide holes, respectively, to align each of said plates separately by said guide pins while laminating each plate on said horizontal base, and to return said guide pins to the initial position thereof.

5,487,809

METHOD FOR MANUFACTURING TAPE TAB STOCK THAT MAY BE USED TO PRODUCE TAPE TAB FASTENERS FOR DISPOSABLE ABSORBENT ARTICLES

David J. K. Goulait, and David W. Cabell, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 21, 1994, Ser. No. 263,115
Int. Cl.[6] B32B *31/18;31/08*
U.S. Cl. 156—259 **15 Claims**



1. A method for manufacturing tape tab stock that may be used to form tape tabs for use with a disposable absorbent article, the method comprising the steps of:

providing a backing substrate having a first surface, a first longitudinal centerline, a transverse centerline perpendicular to said longitudinal centerline and a pair of longitudinal edges;

applying a pressure-sensitive adhesive to at least a portion of said first surface of said backing substrate;

slitting said backing substrate in a direction parallel to said longitudinal centerline to form at least two segments, each said segment having an inner longitudinal edge;

separating said segments in a direction parallel to said transverse centerline;

contacting a release substrate, having a release surface, an adhesive surface and a second longitudinal centerline, with said pressure-sensitive adhesive, such that said release surface covers said pressure-sensitive adhesive and forms a unitary laminate comprising said segments and said release substrate;

applying a construction adhesive to at least a portion of said adhesive surface of said release substrate;

slitting said laminate in a direction parallel to said longitudinal centerline; and

separating said laminate into tape tab stock.

12. A method for manufacturing tape tab stock that may be used to form tape tabs for use with a disposable absorbent article, the method comprising the steps of:

providing a backing substrate having a pair of longitudinal edges;

applying a pressure-sensitive adhesive to said first surface of said backing substrate;

contacting a release substrate, having a release surface and an adhesive surface, with said pressure-sensitive adhesive, such that said release surface covers said pressure-sensitive adhesive forming a unitary laminate; and

applying a construction adhesive to at least a portion of said adhesive surface of said release substrate and at least a portion of said backing substrate forming a tape tab stock.

5,487,810

PROCESS FOR PRETREATING SURFACES OF PLASTIC ITEMS

Siegfried Thurm, Meerbusch; Klaus Sommer, Bergisch Gladbach; Peter Bier, Krefeld; Andreas Elschner, Mülheim/Ruhr; Manfred Kowitz, Moers, and Axel Sandquist, Monheim, all of, Germany, assignors to Bayer AG, Leverkusen, Germany

PCT No. PCT/EP93/00630, § 371 Date Sep. 16, 1994, § 102(e) Date Sep. 16, 1994, PCT Pub. No. WO93/19218, PCT Pub. Date Sep. 30, 1993
PCT Filed Mar. 17, 1993, Ser. No. 302,844
Claims priority, application Germany, Mar. 26, 1992, 42 09 807.6; Mar. 5, 1993, 43 06 971.1
Int. Cl.[6] C03C *15/00*
U.S. Cl. 216—67 **4 Claims**

1. A process for pretreating the surface of plastic items in a low-pressure plasma for the subsequent application of layers, especially metallic layers, wherein a process gas is used for the low-pressure plasma which contains sulphur hexafluoride (SF_6), characterised in that this process gas is kept essentially free of oxygen and the plastic surface is kept free of adsorbed or included fluorine during pretreatment.

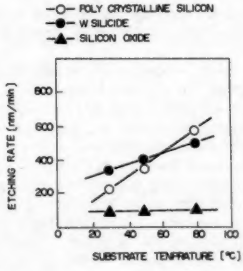
5,487,811

PROCESS FOR PREPARATION OF SEMICONDUCTOR DEVICE

Katsuhiko Iizuka, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Aug. 21, 1991, Ser. No. 748,157
Claims priority, application Japan, Aug. 23, 1990, 2-224030
Int. Cl.[6] H01L *21/00*
U.S. Cl. 156—656.1 **10 Claims**

1. A process for the preparation of a semiconductor device,



which comprises the steps of:

forming a mask including an organic film on a laminated film consisting of a W silicide layer and a non-single crystalline silicon layer formed over a substrate on which an oxide layer is formed;

etching the laminated film under a plasma atmosphere of a mixed gas including a chlorine gas and an oxygen gas but not including a sulfur-bearing gas to fabricate the laminated film into an almost vertical pattern in section, while maintaining the temperature of the substrate at 60° C. or more; and

removing the mask from the laminated film.

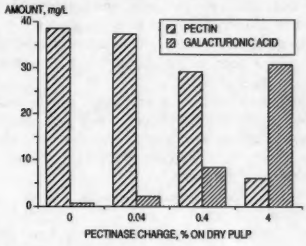
5,487,812

TREATMENT OF ALKALINE BLEACHED MECHANICAL WOOD PULP WITH PECTINASE

Jeffrey W. Thornton; Christer S. Eckerman; Rainer O. Ekman, and Bjarne R. Holmbom, all of Åbo, Finland, assignors to Mesta-Serla Oy, Mantta, Finland

Continuation of Ser. No. 874,867, Apr. 28, 1992, abandoned. This application Aug. 23, 1994, Ser. No. 294,876
Claims priority, application Finland, May 2, 1991, 912136
Int. Cl.[6] D21C *3/00*
U.S. Cl. 162—72 **9 Claims**

1. A method for the treatment of mechanical wood pulp in a



paper making process comprising:

bleaching the mechanical wood pulp under alkaline conditions to form alkaline treated mechanical wood pulp comprising wood fibers and an aqueous phase, wherein anionic pectins are released from the fibers and become dissolved into the aqueous phase by the alkaline treatment of the fibers;

treating said alkaline treated mechanical wood pulp comprising the wood fibers and the aqueous phase containing the dissolved anionic pectins with pectinuse wherein said pectinase decomposes the dissolved anionic pectins of said aqueous phase into galacturonic acid; and

subjecting the treated wood pulp to dewatering.

5,487,813

STRONG AND SOFT CREPED TISSUE PAPER AND PROCESS FOR MAKING THE SAME BY USE OF BIODEGRADABLE CREPE FACILITATING COMPOSITIONS

Kenneth D. Vinson; Paul T. Weisman, both of Cincinnati, and Dean V. Phan, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

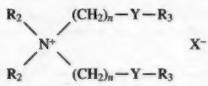
Filed Dec. 2, 1994, Ser. No. 348,434
Int. Cl.[6] D21H *21/22*
U.S. Cl. 162—111 **31 Claims**

1. A soft creped tissue paper comprising:

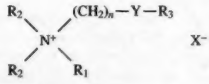
a) papermaking fibers; and

b) a biodegradable crepe facilitating composition comprising:

i) from about 0.02% to about 1.0% by weight, of a biodegradable bonding inhibitor, based on the dry weight of the papermaking fibers, having the formula:



or



wherein each R_2 substituent is a C1–C6 alkyl or hydroxyalkyl group, benzyl group or mixtures thereof; each R_1 substituent is a C12–C22 hydrocarbyl group, or substituted hydrocarbyl group or mixtures thereof; each R_3 substituent is a C11–C23 hydrocarbyl group, or substituted hydrocarbyl or mixtures thereof; Y is —O—C(O)— or —C(O)—O— or —NH—C(O)— or —C(O)—NH— or mixtures thereof; n is 1 to 4 and X= is a suitable anion;

ii) from about 0.02% to about 0.5% by weight, of a water soluble carboxymethyl cellulose, based on the dry weight of the papermaking fibers, wherein said carboxymethyl cellulose has a degree of substitution ranging from about 0.3 to about 1.4; and

iii) from about 0.05% to about 3.0% by weight, of a cationic starch, based on the dry weight of the papermaking fibers, wherein said cationic starch has a degree of substitution ranging from about 0.01 to about 0.1.

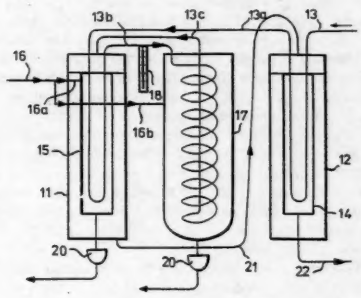
5,487,814

METHOD FOR DISTILLING AND STERILIZING FEED WATER

Lauri Santasalo, Helsinki, Finland, assignor to Finn-Aqua Santasalo-Sohlberg Oy, Hyryla, Finland

Filed Sep. 28, 1993, Ser. No. 128,468
Claims priority, application Finland, Jan. 1, 1992, 924433
Int. Cl.[6] B01D *3/06*; C02F *1/06*
U.S. Cl. 203—2 **18 Claims**

1. A method for ensuring the sterility of distillate in a multi-stage



distilling apparatus having at least two distillation columns, comprising the steps of:

operating a first distillation column at a specific temperature,

passing feed water to be sterilized in a flow line through the first column without releasing the feed water into the first column,

heating the feed water in the flow line as it passes through the first column,

passing the feed water from the first column to a heat exchanger,

retaining the feed water in the heat exchanger for a delay time until the temperature of the feed water contained within the flow line passing through the first column reaches a temperature equal to or greater than the operating temperature of the first column and the feed water is sterilized, the delay time being calculated as a function of the operating temperature of the first column,

removing the feed water from the heat exchanger after said delay time,

returning the feed water to the first column and releasing the feed water from the flow line into the first column,

vaporizing at least a portion of the sterilized feed water in the first column,

condensing the vaporized portion of the sterilized feed water in the first column to form a sterile distillate, and

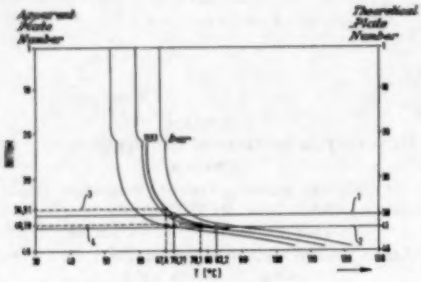
removing the sterile distillate from the first column.

5,487,815

METHOD OF OPTIMIZING THE CONTROL OF THE MASS TRANSFER ZONE IN DISTILLATION COLUMNS

Hermann Rathert, Schwalbach am Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Germany

Continuation of Ser. No. 806,739, Dec. 12, 1991, abandoned. This application Feb. 2, 1994, Ser. No. 191,389
Claims priority, application Germany, Dec. 15, 1990, 40 40 185.5
Int. Cl.[6] B01D 3/42
U.S. Cl. 203—2 5 Claims



1. A method of optimizing the performance of a heated distillation column, consisting essentially of the steps of:

a) providing a heated distillation column having a mass transfer zone, a plurality of measurement positions which correspond to theoretical plate numbers, and design data for optimum separation efficiency, said design data including a plurality of pressure dependent characteristic curves which assign to each measurement position of the distillation column corresponding to a theoretical plate number a nominal temperature,

b) feeding a distillable mixture to the distillation column and conducting said distillation process at an operating pressure to obtain a distilled product from a product take off means, and returning a portion of the distilled product at a reflux rate,

c) measuring a first temperature at a first measurement position corresponding to a first theoretical plate number within said mass transfer zone,

d) measuring a second temperature at a second measurement position corresponding to a second theoretical plate number within said mass transfer zone,

e) selecting a pressure dependent characteristic curve for each of said first and second temperatures,

f) comparing said first temperature to the selected pressure dependent characteristic curve, and determining a first apparent plate number from said first temperature,

g) comparing said second temperature to the selected pressure dependent characteristic curve, and determining a second apparent plate number from said second temperature,

h) determining the difference between said first and second apparent plate numbers,

i) determining the difference between said first and second theoretical plate numbers, and

j) controlling the column heating or the column pressure or the reflux rate using the difference between the apparent plate number difference and the theoretical plate number difference.

5. A method of optimizing the performance of a heated distillation column, consisting essentially of the steps of:

a) providing a heated distillation column having a mass transfer zone, a plurality of measurement positions which correspond to theoretical plate numbers, and design data for optimum separation efficiency, said design data including a plurality of pressure dependent characteristic curves which assign to each measurement position of the distillation column corresponding to a theoretical plate number a nominal temperature,

b) feeding a distillable mixture to the distillation column and conducting said distillation process at an operating pressure to obtain a distilled product from a product take off means, and returning a portion of the distilled product at a reflux rate,

c) measuring a first temperature at a first measurement position corresponding to a first theoretical plate number within said mass transfer zone,

d) measuring a first pressure at said first position,

e) measuring a second temperature at a second measurement position corresponding to a second theoretical plate number within said mass transfer zone,

f) measuring a second pressure at said second position,

g) selecting the characteristic curve corresponding to the first pressure for determining the apparent plate number for the first temperature,

h) comparing said first temperature to the selected pressure dependent characteristic curve, and determining a first apparent plate number from said first temperature,

i) selecting the characteristic curve corresponding to the second pressure for determining the apparent plate number for the second temperature,

j) comparing said second temperature to the selected pressure dependent characteristic curve, and determining a second apparent plate number from said second temperature,

k) determining the difference between said first and second apparent plate numbers,

l) determining the difference between said first and second theoretical plate numbers, and

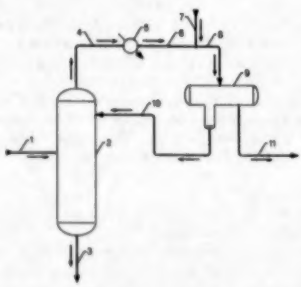
m) controlling the column heating or the column pressure or the reflux rate using the difference between the apparent plate number difference and the theoretical plate number difference.

5,487,816

PROCESS FOR THE REDUCTION OF PHENOL CONTENT IN A CRUDE ORGANIC STREAM RECOVERED FROM A PHENOL STRIPPER

Russell C. Schulz, Glen Ellyn; Constante P. Tagamolila, Arlington Heights, and Patrick J. Bullen, Elmhurst, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed Jun. 24, 1994, Ser. No. 277,686
Int. Cl.[6] B01D 3/34; C07C 37/74
U.S. Cl. 203—14 5 Claims



1. A process for the separation of an admixture comprising phenol, alpha-methylstyrene (AMS) and water to produce an organic stream comprising alpha-methylstyrene and phenol which process comprises:

(a) introducing said admixture comprising phenol, alpha-methylstyrene and water into a fractionation zone;

(b) removing a high purity stream of phenol from the bottom of said fractionation zone;

(c) removing an overhead vapor stream comprising alpha-methylstyrene, phenol and water from said fractionation zone;

(d) condensing at least a portion of said overhead vapor stream to produce an aqueous phase comprising phenol and an organic phase comprising alpha-methylstyrene and phenol;

(e) introducing a base into the overhead of said fractionation zone to maintain the pH of said aqueous phase comprising phenol greater than about 6 so as to partition a large portion of the phenol into the aqueous phase from the organic phase;

(f) refluxing at least a portion of said aqueous phase comprising phenol and having a pH greater than about 6 to said fractionation zone; and

(g) recovering an organic stream comprising alpha-methylstyrene and phenol.

5. A process for the separation of an admixture comprising phenol, alpha-methylstyrene (AMS) and water to produce an organic stream comprising alpha-methylstyrene and phenol which process comprises:

(a) introducing said admixture comprising phenol, alpha-methylstyrene and water into a fractionation zone;

(b) removing a high purity stream of phenol from the bottom of said fractionation zone;

(c) removing an overhead vapor stream comprising alpha-methylstyrene, phenol and water from said fractionation zone;

(d) condensing at least a portion of said overhead vapor stream to produce an aqueous phase comprising phenol and an organic phase comprising alpha-methylstyrene and phenol;

(e) contacting said aqueous phase comprising phenol from step (d) with a base to maintain the pH of said aqueous phase comprising phenol greater than about 6 so as to partition a large portion of the phenol into the aqueous phase from the organic phase;

(f) refluxing at least a portion of said aqueous phase comprising phenol and having a pH greater than about 6 to said fractionation zone; and

(g) recovering an organic stream comprising alpha-methylstyrene and phenol.

5,487,817

PROCESS FOR TOCOPHEROLS AND STEROLS FROM NATURAL SOURCES

Christian Fizet, Zimmersheim, France, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 21, 1994, Ser. No. 185,571

Claims priority, application Switzerland, Feb. 11, 1993, 467/93

Int. Cl.[6] B01D *3/34;* **C07D** *311/72*

U.S. Cl. 203—38 **11 Claims**

1. A process for separating tocopherols and sterols from deodorizer sludges comprising sterols, fatty acids, and tocopherols, said process consisting essentially of the steps of:

(a) esterifying the sterols in the deodorizer sludge with fatty acids which are also present in the deodorizer sludge to form a mixture comprising sterol fatty acid esters, fatty acids, and tocopherols;

(b) distilling said mixture to obtain a first distillation fraction containing fatty acid residues, a second distillation fraction containing tocopherols, and a sterol fatty acid ester residue;

(c) isolating the tocopherols from the second distillation fraction; and

(d) isolating the sterols from the sterol fatty acid ester residue.

9. A process for separating tocopherols and sterols from deodorizer sludges comprising the steps of:

(a) esterifying the sterols in the deodorizer sludge with fatty acids which are also present in the deodorizer sludge containing sterol esters by heating the deodorizer sludge in a temperature range from about 150° C. to about 250° C. in a time range of from about 1 to about 12 hours to form an esterified sterol deodorizer sludge containing sterol esters;

(b) distilling said esterified sterol deodorizer sludge to form a fatty acid distillate and a residue;

(c) distilling said residue to form a distillate containing tocopherols and a residue containing esterified sterols;

(d) isolating the tocopherols from the distillate containing tocopherols; and

(e) isolating the sterols from the residue containing esterified sterols.

5,487,818

PROCESS FOR SEPARATING PHTHALIMIDO-PEROXYCAPROIC ACID FROM SOLUTIONS IN ORGANIC SOLVENTS

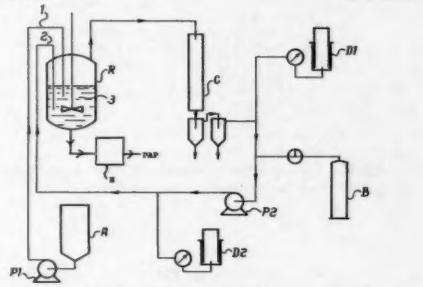
Claudio Cavallotti; Claudio Troglia, both of Milan, and Roberto Garaffa, Naples, all of, Italy, assignors to Ausimont S.p.A., Italy

Continuation-in-part of Ser. No. 97,839, Jul. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 28,661, Mar. 9, 1993, abandoned. This application Aug. 4, 1994, Ser. No. 285,927

Claims priority, application Italy, Mar. 10, 1992, MI92A0539

Int. Cl.[6] B01D *1/14;* **C07D** *209/48*

U.S. Cl. 203—41 **13 Claims**



1. A process for separating phthalimido-peroxycaproic acid (PAP) from a solution of PAP in an organic solvent, said organic solvent having a solubility in water equal to or lower than 10% by weight, and being selected from the group consisting of chlorohydrocarbons and aliphatic esters, said process comprising:

(a) dispersing the solution in an aqueous medium to form a suspension;

(b) evaporating the organic solvent by bubbling an inert gas into the resulting suspension; and

(c) recovering PAP from the suspension.

5,487,819

PRODUCTION OF METALS FROM MINERALS

Peter K. Everett, 2 Linden Way, Castlecrag NSW 2068, Australia

PCT No. PCT/AU93/00311, § 371 Date Dec. 23, 1994, § 102(e) Date Dec. 23, 1994, PCT Pub. No. WO94/00606, PCT Pub. Date Jan. 6, 1994

PCT Filed Jun. 25, 1993, Ser. No. 360,695

Claims priority, application Australia, Jun. 26, 1992, PL3172

Int. Cl.[6] C25C *1/12*

U.S. Cl. 205—347 **47 Claims**

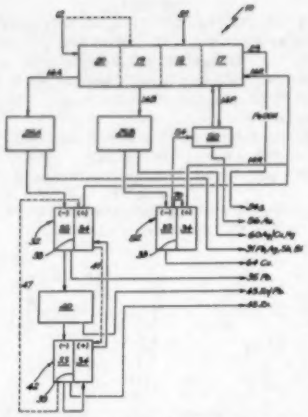
1. A process for producing one or more metals from a mineral containing the same, wherein the mineral is transferred to a leaching process comprising a high oxidation potential zone (hop zone) and a low oxidation potential zone (lop zone) and through which an electrolyte of acid pH is passed from the hop zone to the lop zone, comprising the steps of:

(i) feeding the mineral to the lop zone to contact the electrolyte whereby at least some of the or each metal is leached from the mineral, with at least some of the or each metal that is leached being in a low oxidation valence state;

(ii) electrolysing the electrolyte that leaves the lop zone in an electrolysis process to produce the one or more metals and to increase the oxidation potential of the electrolyte that leaves the electrolysis process;

(iii) returning the electrolyte of increased oxidation potential to the hop zone of the leaching process; and

(iv) reducing the oxidation potential of the electrolyte as it is passed through the hop zone to the lop zone to its level prior to electrolysis; wherein the oxidation potential of the electrolyte is reduced by continuous countercurrent contact of the electrolyte with the mineral as the electrolyte is passed



through the hop zone to the lop zone and as the mineral is passed from the lop zone to the hop zone.

5,487,820

PROCESS FOR REMOVING LEAD DIOXIDE RESIDUES

Rudolf Huber, Garching, and Norbert Paul, Altötting, both of, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Dec. 21, 1994, Ser. No. 361,137

Claims priority, application Germany, Dec. 23, 1993, 43 44 034.7

Int. Cl.[6] C25F *1/00*

U.S. Cl. 205—716 **6 Claims**

1. A process for removing lead dioxide residues on conducting surfaces, which comprises cathodically reducing the lead dioxide in dilute nitric acid as an electrolyte.

5,487,821

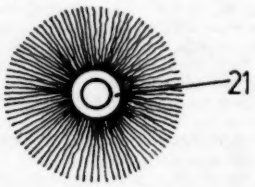
ANODE STRUCTURE FOR MAGNETRON SPUTTERING SYSTEMS

Peter A. Sieck, Santa Rosa; Russell J. Hill, El Cerrito, both of Calif.; John L. Vossen, Bridgewater, N.J., and Stephen C. Schulz, Benicia, Calif., assignors to The BOC Group, Inc., Murray Hill, N.J.

Continuation of Ser. No. 86,136, Jul. 1, 1993, abandoned. This application Apr. 18, 1995, Ser. No. 425,671

Int. Cl.[6] C23C *14/34*

U.S. Cl. 204—192.12 **17 Claims**



1. A magnetron apparatus for sputtering thin films onto a substrate comprising:

an evacuable coating chamber;

a cathode mounted in said coating chamber, wherein the cathode defines an outer target surface that comprises a sputtering material; and

an anode defining an electrically conductive body and having a plurality of points emanating from said conductive body, each of said points being defined by a tip of a wire.

5,487,822

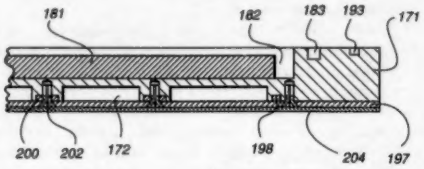
INTEGRATED SPUTTERING TARGET ASSEMBLY

Richard E. Demaray, Portola Valley; David E. Berkstresser, Los Gatos, and Manuel J. Herrera, San Mateo, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 157,763, Nov. 24, 1993, Pat. No. 5,433,835. This application Apr. 29, 1994, Ser. No. 236,715

Int. Cl.[6] C23C *14/34*

U.S. Cl. 204—298.09 **9 Claims**



1. A sputtering target assembly comprising:

a sputtering target in intimate contact with a first side of a backing plate forming part of a target backing plate assembly;

said target backing plate assembly configured to cover an opening of a sputtering chamber so as to seal the opening, said backing plate assembly having heat exchange fluid passages therethrough, said heat exchange fluid passages having one or more inlet and outlet openings,

wherein the target backing plate assembly comprises said backing plate and a cooling cover plate, said backing plate having a generally planar second side, said cooling cover plate having a generally planar third side fluid tightly joined to said second side, grooves being formed in at least one of said second and third sides to form heat exchange cooling passages between said target backing plate and said cooling cover plate,

wherein a bond is formed between said second side of said cooling cover plate and said third side of said backing plate using O-rings and fasteners, and comprises a continuous O-ring in an O-ring groove surrounding said heat exchange cooling passages, and individual O-rings surrounding one or more of the fasteners securing a field of said cooling cover plate within the pattern forming the inside edge of the opening to said third side of said backing plate within the perimeter of a continuous O-ring groove.

5,487,823

SPUTTERING TARGETS HAVING LIFE ALARM FUNCTION

Susumu Sawada, Tokyo; Junichi Anan, Kitaibaraki; Hiroki Nakamura, and Yoshihiro Sakaya, both of Tokyo, all of, Japan, assignors to Japan Energy Corporation, Tokyo, Japan

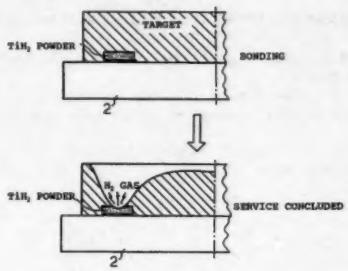
Filed Apr. 26, 1994, Ser. No. 233,171

Claims priority, application Japan, Apr. 28, 1993, 5-125067

Int. Cl.[6] C23C *14/34;14/52*

U.S. Cl. 204—298.12 **7 Claims**

1. A sputtering target having a life alarm function comprising a sputtering target and a gas-component source embedded in a bottom portion of said target.



5,487,824

ELECTROPLATING APPARATUS AND ELECTROPLATING METHOD OF SMALL ARTICLES

Thomas P. Griego, Grants, N.M., assignor to Uemura Kogyo Kabushiki Kaisha, Osaka, Japan

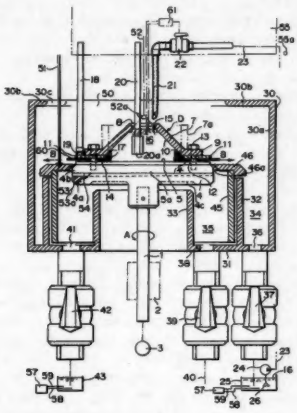
Filed Aug. 26, 1994, Ser. No. 295,055

Claims priority, application Japan, Aug. 31, 1993, 5-215636; Apr. 4, 1994, 6-065999

Int. Cl.[6] C25D *7/00;17/16;21/12*

U.S. Cl. 205—128 **5 Claims**

4. An electroplating method of small articles utilizing an appa-



ratus comprising a treatment room fixed to the upper end of a drive shaft concentrically, the room being tubular with vertical center or the height of the room changing gradually low as radius increases, a cathodic contact ring to supply electricity being disposed the maximum diameter inside part or lower inside end of the treatment room, a porous ring near the contact ring allowing only operation liquid to pass and not allowing small articles to be electroplated to pass, an anode being disposed through an upper opening of the treatment room, the method comprising the steps of:

loading small articles to be treated in the treatment room;

pouring an electroplating liquid until the anode is always dipped;

rotating the above treatment room in a certain time and stopped in a short time or decelerate in a short time and repeating the above cycle;

after a certain time, stopping the supply of electroplating liquid;

supplying rinse water;

after another certain time, stopping the supply of rinse water; and

dehydrating the water centrifugally by high rotation.

5,487,825

METHOD OF PRODUCING ARTICLES OF ALUMINUM, MAGNESIUM OR TITANIUM WITH AN OXIDE CERAMIC LAYER FILLED WITH FLUORINE POLYMERS

Peter Kurze, and Hans-Jürgen Kletke, both of Düren, Germany, assignors to Electro Chemical Engineering GmbH, Zug, Switzerland

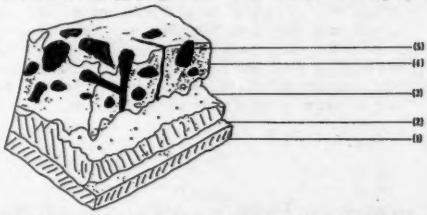
Filed Nov. 25, 1992, Ser. No. 981,343

Claims priority, application Germany, Nov. 27, 1991, 41 39 007.5

Int. Cl.[6] C25D *9/06*

U.S. Cl. 205—200 **4 Claims**

4. A method of applying a wear-resistant oxide ceramic polymer



layer on a rotor of aluminum or aluminum alloy for turbine-driven molecular pumps, the method comprising plasma-chemically anodically oxidizing the rotor in a chloride-free electrolytic bath having a pH value of 7 to 8 at a constant current density of at least 1A/dm^2 until the voltage reaches an end value to form an oxide ceramic layer having a wide-mesh linked capillary system, removing electrolyte residues from the oxide ceramic layer, subsequently, introducing particles of fluorine polymers into the capillary system, each capillary of the capillary system having a diameter, wherein the particles have a particle size which at least in one dimension is smaller than the diameter of the capillaries, and subsequently subjecting the rotor to operating conditions in the molecular pump.

5,487,826

CARDBOARD MAILER PACKAGES

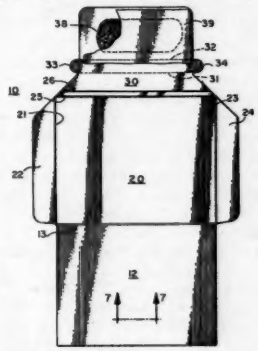
Gordon E. Back, Wallingford, Pa., and Jeffrey P. Greer, Wilmington, Del., assignors to International Envelope Company, Inc., Exton, Pa.

Continuation of Ser. No. 68,464, May 27, 1993, abandoned. This application Jan. 14, 1994, Ser. No. 182,307

Int. Cl.[6] B65D *85/57*

U.S. Cl. 206—308.3 **15 Claims**

1. A mailer package formed from a single sheet of foldable stock



material comprising:

a pair of major, planar, parallel panels overlying one another and joined together along a first fold in the material, the first fold defining at least part of a first of four edges of the mailer package;

a pair of panel tabs extending from opposing edges of one panel of the pair of panels, the pair of panel tabs overlapping and being secured to opposing edge portions of a remaining panel of the pair of panels;

second and third folds connecting the pair of panel tabs with the opposing edges of the one panel, the second and third folds defining at least parts of second and third edges of the mailer package; and

a closure flap extending from a fourth edge of the one panel, the closure flap including at least a pair of lines of perforations therethrough, the lines of perforations extending generally parallel to one another and to a fourth fold joining the closure flap and a fourth edge of the one panel, the closure flap between the lines of perforations protruding laterally from a remainder of the flap to define at least one pull tab, and a remainder of the closure flap being sized and shaped to fit between the pair of panel tabs when the sheet of material is folded along the fourth fold and on to the remaining panel with only each pull tab defined between the lines of perforations overlapping either of the pair of panel tabs.

5,487,827

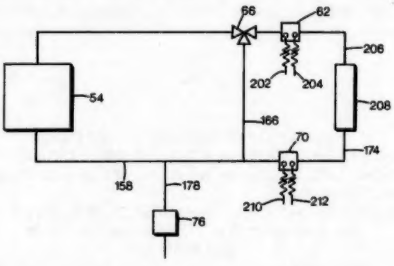
METHOD AND APPARATUS FOR KIDNEY DIALYSIS

Bruce A. Peterson, Milwaukie, and Michael E. Hogard, Oregon City, both of Oreg., assignors to Althin Medical, Inc., Miami Lakes, Fla.

Division of Ser. No. 122,047, Sep. 14, 1993, which is a division of Ser. No. 688,174, Apr. 19, 1991, Pat. No. 5,247,434. This application May 13, 1994, Ser. No. 242,312

Int. Cl.[6] B01D *61/32*

U.S. Cl. 210—87 **15 Claims**



1. A kidney dialysis machine comprising:

a dialyzer with a dialysate compartment, a blood compartment separated from the dialysate compartment by a dialysis membrane, a dialysate input, a dialysate output, a blood input, and a blood output;

means for preparing dialysate and means for circulating the dialysate through a dialysate circuit, the dialysate circuit including the dialysate compartment, the dialysate input and the dialysate output of the dialyzer;

means for effecting extracorporeal circulation of blood from a dialysis patient through a blood circuit, the blood circuit including the blood compartment, the blood input, and the blood output of the dialyzer;

shunting means for directing flow of dialysate away from the dialysate compartment;

sensing means for sensing that no dialysate is flowing to the dialysate compartment whenever said shunting means is directing dialysate flow away from the dialysate compartment; and

means responsive to said sensing means for turning off said means for circulating dialysate through the dialysate circuit whenever said shunting means should be directing dialysate flow away from the dialysate compartment but said sensing means detects dialysate flow to the dialysate compartment.

5,487,828

FILTRATION APPARATUS WITH EXCHANGEABLE FILTERS

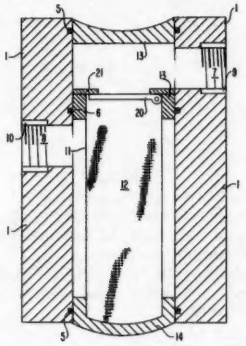
Richard C. Goet, Prinseneiland 53, 1013 LM Amsterdam, Netherlands

Filed Jan. 14, 1994, Ser. No. 181,052

Claims priority, application Netherlands, Jan. 28, 1993, 9300179

Int. Cl.[6] B01D *27/10;29/96*

U.S. Cl. 210—90 **7 Claims**



1. A filtration apparatus with exchangeable filters for filtration of fluids contaminated with solid particles, comprising:

a tubular filter housing of fluid-impermeable material, the housing having a tube wall and a central bore of equal length, the central bore configured for slideably receiving filter cartridges, the central bore having an insertion end, central portion, and discharge end;

a fluid entrance opening provided in the tube wall at the insertion end of the central bore;

a fluid exit opening provided in the tube wall at the central portion of the central bore, the fluid exit opening being diametrically opposed to the fluid entrance opening in the tube wall;

an interchangeable filter cartridge disposed in and substantially the same length as the central bore, the filter cartridge having a first end cap, a second end cap and a hollow, tubular filter element that includes an outer wall, a front end, and a rear end for enclosing a filter chamber, the first end cap being sealed on the front end of the filter element and the second cap being sealed on the rear of the filter element, so that the first end cap and second end cap of the interchangeable cartridge provide end caps for the central bore;

wherein the first end cap sealed on the front end provides an open connection with the outer wall of the filter element, the first end cap being of fluid-impermeable material and sized to match the size of the central bore;

wherein the second end cap sealed on the rear end has an annular opening which communicates with the filter chamber and the fluid entrance opening to establish an open fluid connection, the annular opening being provided with a side opening having a size equal to the size of the fluid entrance opening, the second cap being of fluid-impermeable material and sized to match the size of the central bore;

wherein at least one seal is provided, respectively, between each of the first end cap and second end cap and an inner wall of the tube wall for ensuring that fluid communication through the housing exists only between the fluid entrance opening, the filter cartridge and fluid exit opening; and

wherein the fluid communication between the filter cartridge and the fluid exit opening occurs only through the outer wall of the filter element.

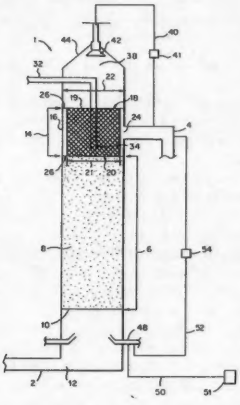
5. A filtration apparatus according to claim **1**, wherein the filter housing is provided with a differential pressure indicator which provides at least one of a signal and an indication when a pressure difference between the fluid entrance opening and the fluid exit opening exceeds a predetermined threshold value.

5,487,829

INTERNAL MEDIA CLEANING DEVICE FOR AEROBIC FLUIDIZED BED REACTORS

Steven I. Safferman, and Paul L. Bishop, both of Cincinnati, Ohio, assignors to The Unite States of America as represented by the Administrator of the United States Environmental Protection Agency, Washington, D.C., and The University of Cincinnati, Cincinnati, Ohio

Filed Mar. 3, 1994, Ser. No. 205,364
Int. Cl.[6] C02F *3/08*
U.S. Cl. 210—151 **11 Claims**



1. An improved reactor for treatment of wastewater having an influent line for wastewater, and effluent line for treated wastewater, and an aerobic bed fluidized by wastewater from said influent line, said bed being located between said influent line and said effluent line and containing particulate media seeded with a layer of bacteria, said improved reactor comprising:

internal particulate media cleaning means located between said bed and an outlet to said effluent line for creating turbulence which shears excess biomass from said particulate media within said cleaning means and permits controlled exit of said excess biomass from said cleaning means and said reactor while maintaining cleaned media within said reactor,

wherein said internal particulate media cleaning means comprises:

at least one cylindrical screen having a longitudinal passage therethrough,

said screen being respectively engaged to an inner periphery of said reactor above and below an outlet to said effluent line by gaskets fixed on opposite ends of said screen, and

air delivery means extending into said longitudinal passage for delivery of air to produce turbulence in a mixture of said waste water and said particulate media within said longitudinal passage.

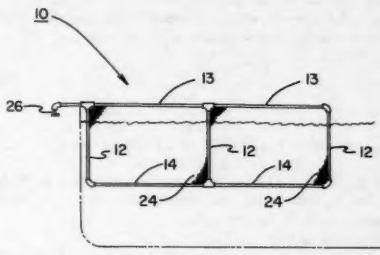
5,487,830

STATIONARY SKIMMING DEVICE FOR A SWIMMING POOL

Daniel B. Huppert, W7641 County Rd. J., Beldenville, Wis. 54003

Filed Oct. 11, 1994, Ser. No. 320,277
Int. Cl.[6] B01D *35/02*
U.S. Cl. 210—169 **1 Claim**

1. A new and improved stationary skimming device for a swimming pool comprising, in combination:



seven tubular frame pipes and one tubular side pipe, each pipe being fabricated of plastic and formed in a hollow generally cylindrical configuration with two open ends, the open end of each pipe including adjustable coupling means affixed thereabout, each pipe including a plurality of radially positioned apertures and adjustable coupling devices affixed along its length, the apparatus including three vertically positioned pipes having an upper end and a lower end, the pipes being positioned in horizontal alignment from the edge of a swimming pool outward, the apparatus including two upper horizontal pipes being positioned between the upper ends of the vertically positioned pipes, the apparatus including two lower horizontal pipes being positioned between the lower ends of the vertically positioned pipes, the lower horizontal pipes including a generally L-shaped shelf formed contiguously with the adjustable coupling devices and extending approximately radially therefrom, the apparatus further including a single tubular side pipe having an inboard end and an outboard end, the inboard end being positioned adjacent to the inboard end of the innermost horizontal pipe, the outboard end of the tubular side pipe being positioned adjacent to the upper end of the central vertical pipe, the apparatus being partially submerged in a swimming pool in the operative orientation;

seven tubular connectors being fabricated of plastic and formed in a hollow generally cylindrical configuration with two or more open ends, three elbow connectors being formed in a curved L-shaped configuration with coupling means affixed within their open ends, two three-way connectors being formed in a hollow generally cylindrical configuration with two linearly positioned open ends and a third open end positioned therebetween, a four-way connector being formed in a hollow generally cylindrical configuration with four open ends, a two-way connector being formed in a hollow generally cylindrical linear configuration with two open ends, the connectors coupling two or more pipes therein and permitting easy assembly and disassembly of the apparatus;

two screens being formed in a generally rectangular configuration, each screen being comprised of a plurality of vertical and horizontally positioned synthetic fibers, the fibers forming a grid configuration with a plurality of generally rectangular shaped holes extending therethrough, the edges of each screen being positioned within the adjustable coupling means along the length of each horizontal and vertical pipe, each screen extending between the horizontal and vertical pipes with the middle vertical pipe separating the two screens therebetween; and

two adjustable hooks each having an inboard region, an outboard region, and a central region therebetween, the inboard region having a generally cylindrical shaped sleeve extending therefrom, the sleeve having an aperture extending vertically therethrough, a hollow cylindrically shaped adjustment tube with a plurality of vertically positioned apertures extending therethrough being positioned within the sleeve, a lock pin formed in a solid generally L-shaped configuration being positioned through the sleeve and adjustment tube with the desired apertures in vertical alignment, the outboard end of the adjustable hook having a generally L-shaped configuration, one end positioned in the central region with the other end positioned under the ledge of a swimming pool, the central region being formed as a hollow cylindrically shaped member contoured into an L-shaped configuration, the central region coupling the inboard and outboard regions, one adjustment hook being coupled to a three-way connector at the inboard end of the vertical pipe, the second adjustment hook

being coupled to the free end of the tubular side pipe, the second hook and side pipe constructed to help stabilize the apparatus as water flows through the screens.

5,487,831

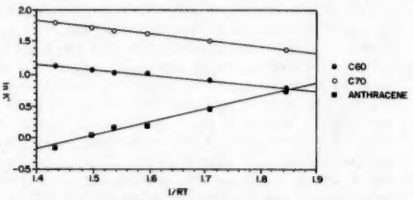
RECOGNITION AND SEPARATION OF CARBON CLUSTERS

William H. Pirkle, Champaign, and Christopher J. Welch, Northbrook, both of Ill., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

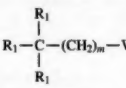
Continuation of Ser. No. 874,791, Apr. 27, 1992, Pat. No. 5,338,529. This application Mar. 23, 1994, Ser. No. 216,758

Int. Cl.[6] B01D *15/08*

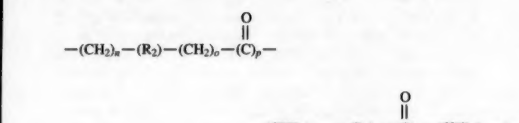
U.S. Cl. 210—198.2 **29 Claims**



1. A chiral selector having immobilized on a support or forming part of a mobile phase compound having the formula:



wherein R_1 is



wherein

R_2 is O, S or NR_{12} wherein R_{12} is independently hydrogen or P═O with the proviso that when R_{12} is P═O, then only one such group is present and all R_2's are additionally bonded to R_{12};

R_4 is independently O, S or NH,

R_3 and R_5 are each independently hydrogen or lower alkyl,

n and o are each independently zero, 1, 2 or 3,

p, q, r, s and t are each independently zero or 1,

Ar is a monocyclic or ortho-fused polycyclic aromatic moiety having up to 10 carbon atoms, either of which may be unsubstituted or substituted with one or more lower alkyl, NO_2, $N(R_6)_3^+$, CN, $COOR_7$, SO_3H, COR_8 and OR_9 wherein R_6, R_7, R_8 and R_9 are each independently hydrogen or lower alkyl;

W is H or $CH{=}CH_2$; and

m is 1 to 10.

5,487,832

FILTER DESIGN

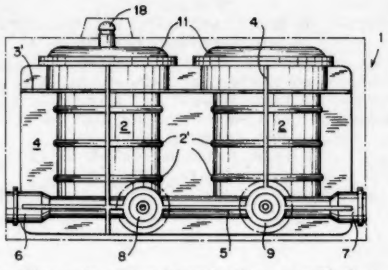
Dacio M. De Souza, Sao Paulo, Brazil, assignor to Brasfilter Industria E Comercio Ltd., Sao Paulo, Brazil

Filed Mar. 29, 1994, Ser. No. 219,811

Int. Cl.[6] B01D *35/30;35/34*

U.S. Cl. 210—232 **5 Claims**

1. A filter apparatus, comprising



a machine-made, cast or injected unitary, monoblock structure including

first and second hollow body filter housings, each of said housings having a substantially cylindrical shape and each of said first and second housings containing a filter element therein,

support means for supporting said first and second filter housings in said structure,

an inlet nozzle, an outlet nozzle, and nozzles for retro-cleaning and purification,

duct means for enabling fluid communication between said first filter housing, said second filter housing, said inlet nozzle, said outlet nozzle, and said nozzles for retro-cleaning and purification, and

a vertical duct arranged in each of said filter housings, said vertical ducts being coupled to said duct means, and

lids for covering said filter housings, said lids being machine-made, cast or injected unitary, monoblock structures.

5,487,833

WATER FILTER WITH ADJUSTABLE INLET HOSE ASSEMBLY

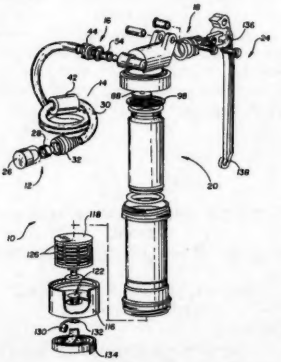
James F. Fife; Daniel J. Vorhis; Kenneth D. Laughlen, and Nancy L. Dienes, all of Seattle, Wash., assignors to Mountain Safety Research (MSR), Seattle, Wash.

Continuation of Ser. No. 108,442, Aug. 18, 1993, Pat. No. 5,330,640, which is a division of Ser. No. 732,975, Jul. 19, 1991, Pat. No. 5,266,196. This application Jul. 15, 1994, Ser. No. 275,800

The portion of the term of this patent subsequent to Nov. 3, 2010, has been disclaimed.

Int. Cl.[6] B01D *27/08*

U.S. Cl. 210—232 **22 Claims**



1. An inlet assembly in combination with a portable water filter, comprising:

an inlet conduit having a first end and a second end, said first end being connected to a water filter, said second end being adapted to be placed in water to be filtered;

a weight coupled to a second end of said inlet conduit, the weight being adapted to maintain the second end below the surface of the water; and

at least one float slidably coupled to the inlet conduit at a position downstream of the second end, said float maintaining the second end off the bottom of the water source, said float being slidably positioned such that a distance between said float and said second end can be varied, thereby positioning said second end at a preferred position between the top surface of the water and the bottom of the water source from which the water is to be drawn into the conduit.

5,487,834

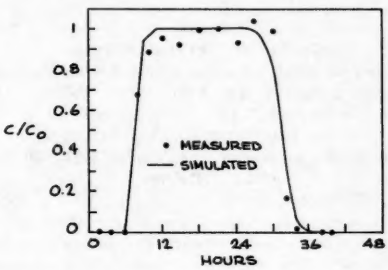
METHODS FOR MICROBIAL FILTRATION OF FLUIDS

Margaret L. Carman, San Ramon; Kenneth J. Jackson, San Leandro; Richard B. Knapp, Danville; John P. Knezovich, Stockton; Nilesh N. Shah, and Robert T. Taylor, both of Livermore, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Feb. 9, 1993, Ser. No. 15,237

Int. Cl.[6] C02F *3/34*

U.S. Cl. 210—606 **43 Claims**



1. A method for purifying subsurface groundwater to remove certain enzymatically degradable contaminants therefrom, comprising the sequential step of:

(A) providing a microorganism capable of producing an enzyme which allows the intact resting-state cells to degrade the contaminants;

(B) growing the microorganisms under conditions which increase the amount and intracellular longevity of the enzyme, to produce an enzyme-enriched intracellular enzyme longevity-enhanced microorganism composition; and

(C) contacting the subsurface groundwater with the enzyme-enriched, intracellular enzyme longevity-enhanced microorganism composition in a resting state;

wherein the microorganism composition having increased whole-cell contaminant-degrading activity is prepared by the process comprising:

(a) providing a microorganism capable of producing an enzyme which allows the microorganism in a resting state to enzymatically degrade organic materials;

(b) providing a cell culture medium by modifying Higgin's minimal nitrate salts medium by omitting $CuSO_4.5H_2O$ therefrom and adding approximately 2× $FeSO_4.7H_2O$ and approximately 2× $NaNO_3$ thereto;

(c) batch cultivating said microorganism in said cell culture medium in a stirred bioreactor at a pH in the range of about 6.8 to 7.2 in an atmosphere containing air, methane and CO_2, to increase the amount of said enzyme produced by the microorganism; and

(d) harvesting the enzyme-enriched microorganism composition provided in step (c).

5,487,835

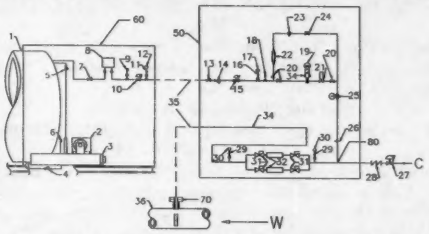
PRESSURIZED SOLUTION FEED SYSTEM FOR PH CONTROL

Tommy J. Shane, Loganville, Ga., assignor to Tomco$_2$ Equipment Co., Loganville, Ga.

Filed Jan. 14, 1994, Ser. No. 182,766

Int. Cl.[6] C02F *1/66*

U.S. Cl. 210—74.9 **7 Claims**



1. A continuous-flow method for introducing a pressurized solution feed into a liquid stream flowing through a pipe for controlling the pH of the liquid stream, comprising the steps of:

a. providing a gas comprising carbon dioxide at a first pressure between about 30 and 300 psig;

b. providing a first liquid comprising water at a second pressure which is a minimum of 50 psig;

c. mixing said gas with said first liquid to form a supersaturated carbon dioxide-water solution at a third pressure and having a first pH;

d. providing said liquid stream comprising a second liquid at a pressure less than said first, second and third pressures and having a second pH greater than said first pH;

e. maintaining said solution at said third pressure until introduced into said liquid stream; and

f. introducing said solution continuously into said liquid stream, releasing excess carbon dioxide from said solution into said liquid stream, to reduce the pH of said liquid stream.

5,487,836

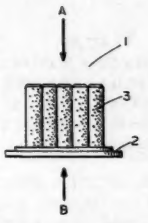
METHOD OF CLEANING A SINTERED POWDERED METAL FILTER

Charles M. Mason, Clyde, and Ted L. Sutton, Enka, both of N.C., assignors to BASF Corporation, Mt. Olive, N.J.

Continuation of Ser. No. 81,575, Jun. 23, 1993, abandoned. This application Jan. 11, 1995, Ser. No. 371,495

Int. Cl.[6] B01D *29/62*

U.S. Cl. 210—791 **24 Claims**



14. A method of cleaning polymer residue from a filter element contaminated by the same from filtration of a polymer melt flow, said method comprising the steps of:

(a) pyrolyzing the polymer residue-contaminated filter element within a chamber heated to a temperature within the range of from about 400° to about 600° C. and for a time sufficient to pyrolyze substantially all of the polymer residue while simultaneously flushing the chamber with steam to prevent combustion of the polymer residue;

b) treating the pyrolyzed filter element obtained from step (a) with a solvent; and

(c) back-flushing the filter element with a pressurized fluid stream by passing the fluid stream through the filter element in a direction opposite to the polymer melt flow therethrough.

5,487,837

GREASE COMPOSITION FOR CONSTANT VELOCITY JOINT

Takahiro Ozaki; Tomoo Munakata; Fumio Goto, and Tetsuo Tsuchiya, all of Tokyo, Japan, assignors to Showa Shell Sekiyu K. K., Tokyo, Japan

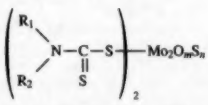
Filed Dec. 29, 1994, Ser. No. 366,119

Claims priority, application Japan, Dec. 29, 1993, 5-353700

Int. Cl.[6] C10M *141/02;141/06*

U.S. Cl. 252—25 **1 Claim**

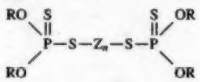
1. A grease composition consisting essentially of a grease containing, in a base oil thereof, from 2 to 40% by weight, based on the total composition, of tricalcium phosphate $Ca_3(PO_4)_2$, the grease further containing (A) from 0.5 to 10% by weight, based on the total composition, of a molybdenum dialkyldithiocarbamate sulfide represented by formula (I):



(I)

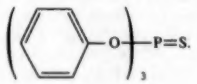
wherein R_1 and R_2 each represent an alkyl group having 1 to 24 carbon atoms; m represents an integer of 0 to 3; and n represents an integer of 1 to 4; provided that the sum of m and n is 4;

and (B) from 0.1 to 5% by weight, based on the total composition, of at least one of (B-1) a zinc dialkyldithiophosphate represented by formula (II):



(II)

wherein R represents a primary or secondary alkyl group; and (B-2) triphenyl phosphorothionate represented by formula (III)



(III)

5,487,838

REACTION PRODUCTS OF A BORON COMPOUND AND A PHOSPHOLIPID, AND LUBRICANT AND AQUEOUS FLUIDS CONTAINING SAME

Carmen V. Luciani, Wickliffe, and Syed Q. A. Rizvi, Painesville, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 687,271, Apr. 18, 1991, abandoned. This application Mar. 28, 1994, Ser. No. 218,860

Int. Cl.[6] C10M *139/00;* **C07F** *9/02*

U.S. Cl. 252—49.9 **38 Claims**

1. A composition, prepared by reacting a combination consisting essentially of

(A) at least one boron compound selected from the group consisting of boron oxide, boron oxide hydrate, boron trioxide, boron trifluoride, boron tribromide, boron trichloride, boron acids, boric acid, tetraboric acid, metaboric acid, boron anhydride, boron amide, esters of boron acids and complexes of boron trihalide and

(B) at least one phospholipid.

5,487,839

GREASE COMPOSITIONS

James N. Vinci, Mayfield Heights; Syed Q. A. Rizvi, Painesville, and Carmen V. Luciani, Wickliffe, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 975,362, Nov. 12, 1992, abandoned, which is a continuation-in-part of Ser. No. 687,271, Apr. 18, 1991, abandoned. This application Aug. 18, 1994, Ser. No. 292,552

Int. Cl.[6] C10M *139/00;137/00*

U.S. Cl. 252—49.9 **36 Claims**

1. An improved grease composition comprising a major amount of an oil based simple metal soap thickened base grease and a minor amount of at least one phosphorus and boron containing composition, said phosphorus and boron containing composition prepared by reacting a combination of (A) at least one boron compound selected from the group consisting of boron oxide, boron oxide hydrate, boron trioxide, boron trifluoride, boron tribromide, boron trichloride, boron acids, boric acid, tetraboric acid, metaboric acid, boron anhydride, boron amide, esters of boron acids and complexes of boron trihalide and (B) at least one phospholipid.

5,487,840

MAGNETIC FLUID COMPOSITION

Toshikazu Yabe; Atsuhiro Yamamoto, both of Saitama; Atsushi Yokouchi, Kanagawa, and Kunio Esumi, Chiba, all of, Japan, assignors to NSK Ltd., Tokyo, Japan

Filed Jan. 5, 1994, Ser. No. 177,471

Claims priority, application Japan, Jan. 20, 1993, 5-007729

Int. Cl.[6] H01F *1/44*

U.S. Cl. 252—62.51 **2 Claims**

1. A magnetic fluid composition comprising a low-volatile organic solvent as a carrier having dispersed therein ferromagnetic fine particles coated with a surface active agent having a lipophilic group having affinity to said low-volatile organic solvent, and a thixotropy-imparting agent, wherein the amount of ferromagnetic fine particles is 10 to 40% by weight based on the magnetic fluid composition,

wherein said thixotropy-imparting agent is selected from the group consisting of at least one of organic modified bentonite, lipophilic smectite, organic surface-modified precipitated calcium carbonate of calcite structure, hydrogenated castor oil, a fatty acid amide, and a swelling mica-organic substance complex.

5,487,841

MAGNETIC COMPOSITIONS WITH SURFACE ADDITIVES

Eugene F. Young, Rochester, and Dennis J. O'Keefe, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 299,875, Sep. 1, 1994. This application Jun. 5, 1995, Ser. No. 464,920

Int. Cl.[6] C04B *35/47;* **C01G** *49/06*

U.S. Cl. 252—62.59 **2 Claims**

2. A composition comprised consisting essentially of resin particles, magnetite treated, or coated with a phosphate titanium coupling component, wax component, a charge additive, and surface additives comprised of a mixture of colloidal silica and strontium titanate, and wherein said magnetite particles are present in an amount of from about 15 to about 50 weight percent.

5,487,842

METAL EXTRACTANT SOLUTION COMPRISING N-ETHYL HYDROXAMIC ACID CHELANTS AND KEROSENE SOLVENT

Bruce F. Monzyk, Maryland Heights, Mo., assignor to Met-Tech Systems Limited, Burlington, Canada

Continuation-in-part of Ser. No. 890,882, May 29, 1992, Pat. No. 5,328,626, which is a continuation-in-part of Ser. No. 732,989, Jul. 19, 1991, Pat. No. 5,174,917. This application Jul. 11, 1994, Ser. No. 272,834

The portion of the term of this patent subsequent to Dec. 29, 2009, has been disclaimed.

Int. Cl.[6] **C09K** *3/00;* **C22B** *3/00;* **C21B** *3/00*

U.S. Cl. 252—60 **3 Claims**

1. An organic metal extractant solution comprising a kerosene solvent and at least about 5 weight percent N-ethyl alkanohydroxamic acid of the formula $RC(O)N(OH)CH_2CH_3$, wherein R is a straight chain alkyl group of 8 to 10 carbon atoms or a branched alkyl group of 8 to 30 carbon atoms, provided said alkyl group is not a cycloalkyl group and wherein said solution has a kinematic viscosity at 23° C. of less than 20 mm^2/s.

5,487,843

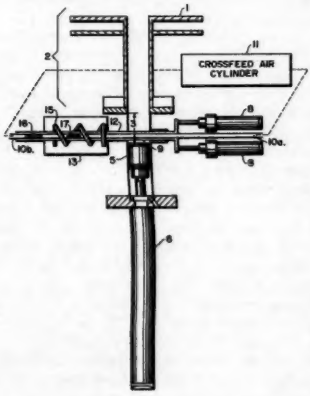
PROCESS FOR ACCURATELY CONTROLLING MOISTURE LEVELS OF AQUEOUS SURFACTANT COMPOSITIONS DURING ON LINE PROCESSING

Laurie Coyle, North Arlington; Kevin M. Finucane, Saddle Brook; Alan P. Greene, Flemington, all of N.J., and Robert E. Moran, Wappingers Falls, N.Y., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Sep. 8, 1994, Ser. No. 303,119

Int. Cl.[6] **C11D** *1/00;11/00*

U.S. Cl. 252—89.1 **3 Claims**



1. A process for preparing an aqueous surfactant composition or slurry comprising:

(i) mixing components comprising

(a) 5% to 95% by wt. of a surfactant selected from the group consisting of anionic surfactants, nonionic surfactants, cationic surfactants, amphoteric and zwitterionic surfactants and mixtures thereof; and

(b) 5% to 95% by wt. water;

(ii) heating and/or mixing the component mixture;

(iii) removing a sample amount of the component mixture from a mixer or container while holding or processing the mixture, which sample amount is to be sampled by a device containing a nuclear magnetic resonance (NMR) sensor;

(iv) submitting the sample to an NMR sensor and measuring on-line NMR parameters of the sample and comparing the parameters to a preset calibration curve to obtain desired moisture levels; and repeating the NMR evaluation until the desired moisture level is obtained

(v) releasing the mixture for further processing upon reaching desired moisture level.

5,487,844

FLOCCULATING AGENT FOR THE PURIFICATION OF FLUIDS

Sanai Fujita, nO. 2256-13 kITATOKOROZAWA-CHO, Tokorozawa-Shi, Saitama-Ken, Japan

Division of Ser. No. 88,160, Jul. 7, 1993, Pat. No. 5,397,499, which is a division of Ser. No. 756,809, Sep. 9, 1991, Pat. No. 5,254,285, which is a continuation of Ser. No. 276,265, Nov. 25, 1988, Pat. No. 5,047,255. This application Jan. 17, 1995, Ser. No. 373,004

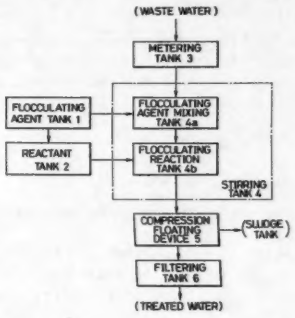
Claims priority, application Japan, Apr. 28, 1988, 63-105579; Apr. 28, 1988, 63-105580

The portion of the term of this patent subsequent to Oct. 19, 2010, has been disclaimed.

Int. Cl.[6] **C02F** *5/00;1/52*

U.S. Cl. 252—175 **5 Claims**

1. A flocculating agent for purification of fluids, said flocculating



agent comprising a mixture of:

a first liquid and a second liquid;

said first liquid comprising calcined animal bone dissolved in at least one acid for dissolving said calcined animal bone, said at least one acid of said first liquid consists essentially of at least one member of the group consisting of:

hydrochloric acid and sulfuric acid;

said second liquid comprising at least one metal dissolved in at least one acid for dissolving said at least one metal, said at least one metal consists essentially of at least one member of the group consisting of:

copper, iron, and zinc, and said at least one acid of said second liquid consists essentially of at least one member of the group consisting of:

hydrochloric acid and sulfuric acid; and

said calcined animal bone and said at least one metal being present in quantities sufficient to promote coagulation and solidification of organic substances present in a liquid containing said mixture.

5,487,845

FLUOROBENZENE DERIVATIVES AND LIQUID-CRYSTALLINE MEDIUM

Volker Reiffenrath, Rossdorf; Hans A. Kurmeier, Seeheim-Jugenheim; Eike Poetsch, Mühltal; Herbert Plach, Darmstadt; Ulrich Finkenzeller, Plankstadt; Ekkehard Bartmann, Erzhausen; Joachim Krause, Dieburg, and Bernhard Scheuble, Seeheim-Jugenheim, all of, Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Germany

PCT No. PCT/EP90/01471, § 371 Date Nov. 19, 1990, § 102(e) Date Nov. 19, 1990, PCT Pub. No. WO91/03449, PCT Pub. Date Mar. 21, 1991

Continuation of Ser. No. 623,385, Nov. 19, 1990, abandoned.

This PCT application Sep. 3, 1990, Ser. No. 229,842

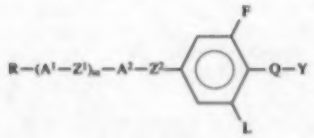
Claims priority, application Germany, Sep. 6, 1989, 39 29 525.7; Sep. 6, 1989, 39 29 526.5; Sep. 7, 1989, 39 29 764.0; Mar. 28, 1990, 40 09 907.5

The portion of the term of this patent subsequent to Oct. 10, 2012, has been disclaimed.

Int. Cl.[6] C09K *19/30;19/12*

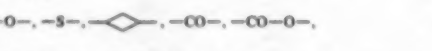
U.S. Cl. 252—299.63 **36 Claims**

1. A liquid-crystals medium comprising at least two liquid-crystalline components, wherein at least one component is a fluorobenzene compound of the formula I,



in which

R is H or allyl or 1 to 15 carbon atoms which is unsubstituted or monosubstituted by CN or CF_3 and in which one or more CH_2 groups can be replaced, in each case independently of one another, by



in such a manner that O atoms are not linked directly to one another,

A^1 and A^2, in each case independently of one another, are a

(a) trans-1,4-cyclohexylene in which one or more non-adjacent CH_2 groups can also be replaced by —O— and/or —S—,

(b) 1,4-phenylene in which one or two CH groups can also be replaced by N,

(c) 1,4-cyclohexenylene, 1,4-bicyclo(2.2.2)octylene, piperidine-1,4-diyl, naphthalene-2,6-diyl, decahydronaphthalene-2,6-diyl or 1,2,3,4-tetrahydronaphthalene- 2,6-diyl,

wherein only one of A^1 and A^2 is Phe in which Phe is 1,4-phenylene which is unsubstituted or mono- or disubstituted by F or Cn, it being possible for the radicals (a) and (b) to be substituted by CN or fluorine,

Z^1 and Z^2, in each case independently of one another, are —CO—O—, —O—CO—, —CH_2O—, —OCH_2—, —CH_2CH_2—, —CH=CH—, —C≡C— or a single bond, one of Z^1 and Z^2 can also be —$(CH_2)_4$— or —CH=CH—CH_2CH_2—,

L is F,

m is 0, 1 or 2,

Y is F or Cl, and

Q is a single bond; and

wherein said medium contains 45–90 wt. % of compounds of formula I.

5,487,846

RUST INHIBITOR

Shigeru Otomo, Abiko, Japan, assignor to Union Chemical Co., Ltd., Tokorozawa, Japan

Continuation of Ser. No. 46,305, Apr. 15, 1993, abandoned.

This application Oct. 4, 1994, Ser. No. 317,778

Claims priority, application Japan, May 15, 1992, 4-148837

Int. Cl.[6] C23F *11/00*

U.S. Cl. 252—389.61 **5 Claims**

1. A rust inhibitor composition comprising calcium 3-pentafluoroethyl-6-hydroxybenzoate.

5,487,847

PROCESS FOR THE PREPARATION OF CONDUCTIVE POLYMERIC PARTICLES WITH LINEAR AND CROSSLINKED PORTIONS

Hadi K. Mahabadi, Toronto; Denise Y. Wright, Calgary; Michael F. Cunningham, Georgetown, all of, Canada, and John A. Creatura, Ontario, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 11, 1994, Ser. No. 225,855

Int. Cl.[6] G03G *5/00;9/10;* **C08F** *2/14;2/32*

U.S. Cl. 252—511 **30 Claims**

1. A process for the preparation of conductive polymeric particles with linear and crosslinked portions consisting essentially of:

a) mixing a (co)monomer with at least one conductive filler, solvent, at least one polymerization initiator in the amount of about 0.1 to about 20 weight percent of said (co)monomer, and a chain transfer component in the amount of about 0.01 to about 1 weight percent of said (co)monomer; effecting solution polymerization by heating until from about 80 to about 100 weight percent of the (co)monomer has been polymerized; drying the mixture by removing the solvent to yield an intimate blend of polymer with conductive filler; and

b) dispersing the aforementioned blend of polymer and conductive filler in at least one additional (co)monomer with additional polymerization initiator in an amount of from about 0.1 to about 20 weight percent of said additional (co)monomer, a crosslinking agent in the amount of about 0.1 to about 5 weight percent of said additional (co)monomer, and an additional chain transfer component in an amount of from about 0.01 to about 1 weight percent of said additional (co)monomer to form an organic phase; dispersing the resulting organic phase mixture in water containing a stabilizing component in the amount of about 0.1 to about 5 weight percent of said water to obtain a suspension of particles with an average volume diameter of from about 0.05 to about 5 microns in water; polymerizing the resulting suspension by heating; and subsequently optionally washing and drying the polymeric product to produce conductive polymer particles;

wherein the (co)monomer, polymerization initiator, and chain transfer component in a) is the same as or different from the additional (co)monomer, polymerization initiator, and chain transfer component in b), respectively; and

wherein the total amount of conductive filler is from about 1 to about 50 weight percent, and the total amount of polymer is from about 50 to about 99 weight percent.

5,487,848

PREPARATION OF DIFUNCTIONAL INITIATORS FOR ANIONIC POLYMERIZATION

Timothy J. Fuller, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 25, 1994, Ser. No. 279,610

Int. Cl.[6] C07F *1/02;1/04;1/06*

U.S. Cl. 260—665 R **11 Claims**

1. A process comprising dimerizing a 1-halogen-3,3-diphenylpropane compound to form a 1,1,6,6-tetraphenylhexane compound.

4. A process comprising reacting a 3,3-diphenyl-1-propanol compound with a 1-halogen-3,3-diphenylpropane compound to form a bis(3,3-diphenyl-1-propyl) ether compound, and reacting the bis(3,3-diphenyl-1-propyl) ether compound with an organometallic compound or an alkali metal to form a second polymerization initiator compound.

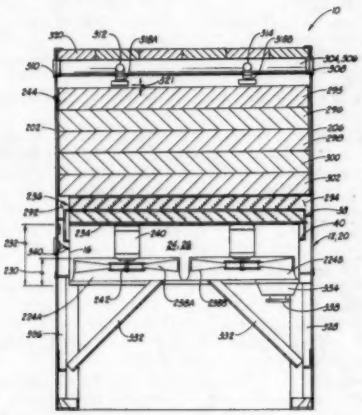
6. A process comprising reacting a 1-halogen-3,3-diphenylpropane compound with allyl halogen to form a 6,6-diphenyl-1-hexene compound, and reacting the 6,6-diphenyl-1-hexene compound with an organometallic compound to form a third polymerization initiator compound.

5,487,849

PULTRUDED COOLING TOWER CONSTRUCTION

Harold D. Curtis, Chickasha, Okla., assignor to Tower Tech, Inc., Chickasha, Okla.

Filed Dec. 3, 1993, Ser. No. 161,069
Int. Cl.[6] B01F *3/04*
U.S. Cl. 261—30 **19 Claims**



10. A cooling tower, comprising:

a combined basin and supporting frame assembly including four hollow outer beams, said outer beams being structurally connected together at their ends to form a four-sided rectangular supporting frame, said outer beams each having an enclosed interior, said interiors being communicated together to define a basin for collecting liquid, at least one basin inlet defined in said supporting frame assembly, said outer beams defining a generally rectangular plenum space laterally surrounded by said four outer beams;

four walls extending vertically upward from and supported from said four outer beams;

a first air supply duct extending upward into said plenum space, said first air supply duct having an air intake opening defined in a bottom thereof and an air discharge outlet opening into said plenum space;

a first vertical axis fan located in said first air supply duct;

a drainage collection system supported on said supporting frame assembly above said plenum space, said drainage collection system including at least a first layer having a plurality of parallel elongated collection plates having a length, said collection plates being sloped and overlapping in a direction transverse to said length of said collection plates, said drainage collection plates draining through said at least one basin inlet into said basin;

a body of fill material located directly above said drainage collection system and within said four walls; and

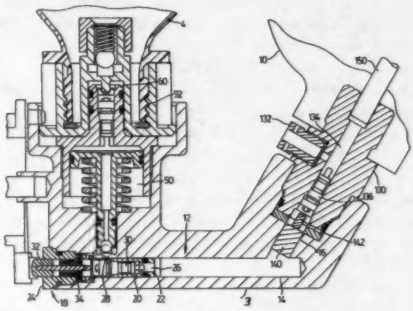
a liquid distribution system located above said body of fill material.

5,487,850

GAS CONTROL VALVE

Richard D. Vanderploeg, 1100 Burloak Drive, Burlington, Ontario, Canada

Filed Aug. 24, 1993, Ser. No. 110,923
Int. Cl.[6] B01F *3/04*
U.S. Cl. 261—64.1 **18 Claims**



1. A device for activating the release of pressurized gas through a passage, including:

(a) valve means disposed within said passage, said valve means having an inlet and an outlet, said valve means moveable between an open position to permit communication of said gas with said passage, and said inlet and outlet, and a closed position to stop communication of said gas between said inlet and outlet;

(b) piston means for activating said valve means between said open and closed position where said piston is spaced from said valve;

(c) support means associated with said piston means for slidably supporting said piston means between said open and closed positions.

5,487,851

COMPOSITE GUN PROPELLANT PROCESSING TECHNIQUE

David R. Dillehay; David W. Turner, both of Marshall; Horace L. Wingfield, III, Longview, all of Tex., and James A. Blackwell, Shreveport, La., assignors to Thiokol Corporation, Ogden, Utah

Filed Dec. 20, 1993, Ser. No. 170,391
Int. Cl.[6] C06B *21/00*
U.S. Cl. 264—3.3 **42 Claims**

1. A method of making composite gun propellant comprising the steps of:

(a) introducing a lacquer solution into a twin-screw extruder, said lacquer solution containing a quantity of cellulose ester binder and nitrocellulose;

(b) adding a quantity of dry oxidizer to the twin-screw extruder, said oxidizer having a weight-mean-diameter particle size of less than about 5 microns; and

(c) extruding the composite gun propellant with the twin-screw extruder, said extruding step including the steps of mixing the dry oxidizer and the lacquer solution and removing excess solvent from the oxidizer/lacquer solution mixture.

5,487,852

LASER-MACHINING POLYMERS

Michael J. Ludden, Swindon; Richard J. Penneck, Lechlade, and Nicholas J. G. Smith, Cricklade, all of, England, assignors to Raychem Limited, Swindon, England

PCT No. PCT/GB89/00109, § 371 Date Feb. 26, 1991, § 102(e) Date Feb. 26, 1991, PCT Pub. No. WO89/07337, PCT Pub. Date Aug. 10, 1989

PCT Filed Feb. 3, 1989, Ser. No. 548,962

Claims priority, application United Kingdom, Feb. 5, 1988, 88025685; Dec. 2, 1988, 8828245

Int. Cl.[6] B23K *26/00*

U.S. Cl. 264—400 26 Claims

1. A method of making an article of polymeric material comprising laser-ablation-machining a body of polymeric material at a laser wavelength, power density, and energy fluence sufficient to remove portions of the body, the body comprising low to zero-charring material selected from the group consisting of:

(a) polyamide material which is aromatic or amorphous or both;

(b) polymer having in its polymer backbone aromatic rings and aliphatic chains, the polymer being selected from the group consisting of polyetheresters and polyimides; and

(c) polyester material other than polyetheresters having in its polymer backbone aromatic rings, ester carboxylate groups and aliphatic chains between the carboxylate groups, which chains having at least 4 carbon atoms.

5,487,853

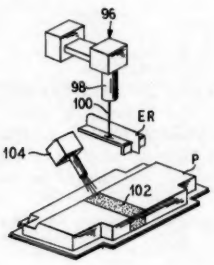
ENERGETIC STITCHING FOR COMPLEX PREFORMS

Daniel T. Buckley, Shrewsbury, Vt., assignor to The C. A. Lawton Company, DePere, Wis.

Continuation-in-part of Ser. No. 22,084, Feb. 25, 1993, Pat. No. 5,364,258, which is a division of Ser. No. 552,253, Jul. 12, 1990, Pat. No. 5,217,656. This application Feb. 14, 1994, Ser. No. 195,175

Int. Cl.[6] B29C *35/08;70/84*

U.S. Cl. 264—496 19 Claims



1. A method of making complex preforms by energetic stitching comprising the steps:

positioning a preform having a preform attachment surface;

positioning a member having a member surface to be placed in surface contact with the preform attachment surface;

applying electromagnetic energy curable binder between said surfaces;

bringing said surfaces together in surface contact; and applying electromagnetic energy to said binder in a manner such that the preform and member will be attached over an area less than the full surfaces where they are in contact.

5,487,854

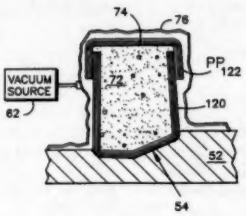
TWO-STATE CO-CURE METHOD FOR FABRICATING A COMPOSITE ARTICLE

Peter B. Leoni, Bethany, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 8, 1994, Ser. No. 302,288

Int. Cl.[6] B29C *44/06*

U.S. Cl. 264—46.4 5 Claims



1. A two-stage co-cure method for fabricating a composite article having a box-beam cross-sectional configuration, comprising the steps of:

setting up a molding assembly that defines an outer mold line surface of an outer shell of the composite article;

laying up prepreg plies that form the outer shell in the molding assembly;

vacuum-bagging the layed-up molding assembly;

subjecting the vacuum-bagged molding assembly to elevated temperature and pressure to cure the layed-up prepreg plies to form the outer shell of the composite article;

de-bagging the vacuum-bagged molding assembly;

reconfiguring the molding assembly as required so that the reconfigured molding assembly and the outer shell in combination define a foam injection cavity;

securing cover plates in combination with the reconfigured molding assembly to close the foam injection cavity;

injecting foam into the foam injection cavity to form an outer shell, cured foam core stabilized combination that defines an inner mold line surface of an inner cap;

removing the cover plates from the reconfigured molding assembly and disassembling the reconfigured molding assembly to expose the outer shell, cured foam core stabilized combination;

applying film adhesive to the exposed outer shell, cured foam core stabilized combination in the disassembled molding assembly;

laying up prepreg plies that form the inner cap of the composite article onto the outer shell, cured foam core stabilized combination in the disassembled molding assembly;

vacuum-bagging the prepreg plies layed up on the outer shell, cured foam core stabilized combination in the disassembled molding assembly; and

subjecting the vacuum-bagged disassembled molding assembly to elevated temperature and pressure to cure the layed-up prepreg plies to form the inner cap of the composite article and to concomitantly cause the applied film adhesive to fuse wherein the inner cap and the outer shell are adhesively bonded in combination to form the composite article.

5,487,855

POLYMERIC BINDERS FOR ENHANCING GREEN STRENGTH OF PRESSED CERAMICS

Kevin J. Moeggenborg, Aurora, and Peter E. Reed, Plainfield, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

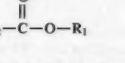
Filed Sep. 16, 1994, Ser. No. 308,053

Int. Cl.[6] C04B *35/64*

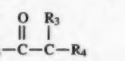
U.S. Cl. 264—63 15 Claims

1. A method for preparing a ceramic material, which comprises:

mixing a ceramic powder with an aqueous solution containing a substantially hydrolyzed copolymer of an ester and an amide to produce a slurry, said ester being of the formula:



wherein R_1 is an unsaturated acyclic hydrocarbon group having about 2 to about 4 carbon atoms, and R_2 is an alkyl group having 1 to about 4 carbon atoms, and said amide being of the formula:



wherein R_3 is hydrogen or an alkyl group having 1 to about 4 carbon atoms, R_4 is an unsaturated acyclic hydrocarbon group having about 2 to about 4 carbon atoms, and R_5 is hydrogen or an alkyl group having 1 to about 4 carbon atoms:

drying the slurry by a process selected from the group consisting of filter pressing, fluidized bed spray drying and tape casting to produce particles which include said copolymer; compacting the particles by a process selected from the group consisting of dry pressing, extrusion, jiggering and slip casting to produce an aggregate structure; and heating the aggregate structure to produce a fired ceramic material.

5,487,856

PROCESS FOR THE MANUFACTURE OF A POST-HEAT SET DYED FABRIC OF POLYAMIDE FIBERS HAVING IMPROVED DYE WASHFASTNESS AND HEAT STABILITY

Anil W. Saraf, Asheville, N.C., assignor to BASF Corporation, Parsippany, N.J.

Continuation of Ser. No. 107,392, Aug. 16, 1993, abandoned. This application Oct. 11, 1994, Ser. No. 321,472

Int. Cl.[6] **D01F** *1/10;6/60*

U.S. Cl. 264—78 **19 Claims**

1. A process for the manufacture of a post-heat set dyed fabric consisting essentially of polyamide fibers having improved dye washfastness and heat stability, which comprises:

(a) forming a homogeneous spinnable polyamide mixture by melt-mixing a fiber-forming polyamide having a relative viscosity of between about 2.0 to about 3.2 with

(i) an amine end group-increasing additive selected from the group consisting of water, alcohols, amines and mixtures thereof, said additive being present in said mixture in an amount between about 0.05 to about 5% by weight, based on the total weight of the polyamide fiber, sufficient to increase the amine end group content of said polyamide fiber to between about 15 to about 70 meq/kg; and

(ii) a heat stabilizer selected from the group consisting of phenolic compounds, phosphites containing aryl groups and mixtures thereof, said heat stabilizer being present in said polyamide fiber in an amount between about 0.025 to about 2% by weight, based on the total weight of the polyamide fiber, sufficient to improve heat stability of the polyamide fiber;

(b) melt-spinning the homogeneous mixture obtained according to step (a) through a spinnerette to form polyamide fibers;

(c) quenching the polyamide fibers;

(d) forming the quenched polyamide fibers into a fabric; and

(e) subjecting the fabric formed according to step (d) to the sequential steps of heat-setting and dyeing, said polyamide fibers of said fabric, when dyed, having improved dye washfastness as determined by a cigar bleed test stain rating of at least 3.5 on color matched samples.

5,487,857

Patent Not Issued For This Number

5,487,858

PROCESS OF MAKING SELF-SUPPORTING WOVEN VASCULAR GRAFT

Peter J. Schmitt, Garnerville, N.Y., assignor to Meadox Medicals, Inc., Oakland, N.J.

Division of Ser. No. 49,230, Apr. 19, 1993, Pat. No. 5,282,848, which is a continuation of Ser. No. 573,932, Aug. 28, 1990, abandoned. This application Jan. 31, 1994, Ser. No. 189,305

Int. Cl.[6] **B29C** *67/00;* **B29D** *23/00*

U.S. Cl. 264—103 **9 Claims**

1. A process for preparing a self-supporting woven vascular graft, comprising:

weaving a plurality of warp yarns with a filling yarn including a stiffening component to provide a woven tubular fabric;

scouring said woven tubular fabric; and

heat setting said woven tubular fabric to set said stiffening component in a generally rounded configuration thereby providing radial rigidity with resiliency to said woven tubular fabric without crimping resulting in a self-supporting woven vascular graft.

5,487,859

PROCESS OF MAKING FINE POLYESTER HOLLOW FILAMENTS

Arun P. Aneja, Greenville; David G. Bennie, Rocky Point; Robert J. Collins, Wilmington; Hans Rudolf E. Frankfort, Kinston; Stephen B. Johnson; Benjamin H. Knox, both of Wilmington, and Elmer E. Most, Jr., Kinston, all of N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 925,042, Aug. 5, 1992, abandoned, Ser. No. 925,041, Aug. 5, 1992, abandoned, and Ser. No. 93,156, Jul. 23, 1993, Pat. No. 5,417,902, which is a continuation-in-part of Ser. No. 926,538, Aug. 5, 1992, abandoned, each , Aug. 5, 0which is a continuation-in-part of Ser. No. 647,381, Jan. 29, 1991, abandoned, and Ser. No. 860,776, Mar. 27, 1992, abandoned, which is a continuation-in-part of Ser. No. 647,371, Jan. 29, 1991, abandoned, said Ser. No. 93,156is a continuation-in-part of Ser. No. 5,672, Jan. 19, 1993, Pat. No. 5,288,553, and Ser. No. 15,733, Feb. 10, 1993, Pat. No. 5,250,245, which is a continuation-in-part of Ser. No. 860,776, Feb. 10, 0, Ser. No. 5,672, Feb. 10, 0, and Ser. No. 979,776, Nov. 9, 1992, Pat. No. 5,356,582, said Ser. No. 5,672is a continuation-in-part of Ser. No. 647,381, Nov. 9, 0, Ser. No. 860,776, Nov. 9, 0, and Ser. No. 979,776, Nov. 9, 0, which is a continuation-in-part of Ser. No. 753,529, Sep. 3, 1991, Pat. No. 5,229,060, Ser. No. 753,769, Sep. 3, 1991, Pat. No. 5,261,472, Ser. No. 786,582, Nov. 1, 1991, Pat. No. 5,244,616, Ser. No. 786,583, Nov. 1, 1992, Pat. No. 5,145,623, Ser. No. 786,584, Nov. 1, 1991, Pat. No. 5,223,197, and Ser. No. 786,585, Nov. 1, 1991, Pat. No. 5,223,198, said Ser. No. 786,582Ser. No. 786,583, Nov. 1, 0, Ser. No. 786,584, Nov. 1, 0, and Ser. No. 786,585, Nov. 1, 0, each , Nov. 1, 0is a continuation-in-part of Ser. No. 338,251, Apr. 14, 1989, Pat. No. 5,066,447, which is a continuation-in-part of Ser. No. 53,309, May 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 824,363, Jan. 30, 1986. This application Mar. 16, 1994, Ser. No. 214,717

The portion of the term of this patent subsequent to Oct. 18, 2011, has been disclaimed.

Int. Cl.[6] **D01D** *5/24;5/253;* **D02J** *1/08;1/22*

U.S. Cl. 264—103 **18 Claims**

1. A spin-orientation process for preparing a yarn bundle of fine polyester continuous filaments that are hollow, having one or more longitudinal voids, and being of void content (VC) at least about 10%; wherein said hollow filaments are formed by a melt-spinning

process comprising the steps of: i) melting polyester polymer of about 13 to about 23 LRV and with a zero-shear melting point ($T_M°$) of about 240 to about 265 C., and a glass transition temperature (T_g) of about 40 C. to about 80 C.; (ii) extruding the resulting melted polyester polymer through a plurality of segmented capillaries arranged so as to provide an extrusion void area (EVA) of about 0.025 mm^2 to about 0.45 mm^2, and so that the ratio of EVA to total extrusion area (EA) is about 0.4 to about 0.8, and such that the ratio of EVA to spun filament denier $(dpf)_s$ is about 0.05 to about 0.55; post-coalescing the resulting plurality of polyester melt streams to form uniform hollow filaments; (iii) quenching the hollow filaments using a protective delay shroud of length (L_{DQ}) about 2 cm to about 12 $(dpf)^{1/2}$cm; (iv) converging the quenched hollow filaments into a multi-filament bundle at a distance (L_C) of about 50 cm to about [50+ 90$(dpf)^{1/2}$] cm while applying spin finish; and (v) withdrawing the multi-filament bundle at a withdrawal speed (V_s) in a range of about 2 to about 5 Km/min; such process conditions being selected to provide an as-spun yarn bundle having: a residual elongation of about 40% to about 160%, tenacity-at-7% elongation (T_7) of about 0.5 to about 1.75 g/d, a (1–S/Sm) ratio of at least 0.1 and differential shrinkage (DHS-S) less than about +2%, where S is the boil-off shrinkage, S_m is the maximum shrinkage potential and DHS is the dry heat shrinkage (measured at 180 C.), and a maximum shrinkage tension (ST_{max}) of less than 0.2 g/d at a peak shrinkage tension temperature T(ST_{max}) of about 5 to about 30 C. greater than about the polymer glass transition temperature (T_g).

5,487,860

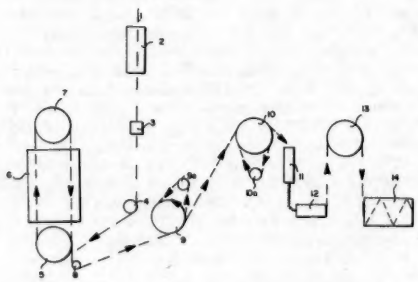
CONTINUOUS PROCESS FOR SPINNING AND DRAWING POLYAMIDE AND APPARATUS THEREOF

George M. Kent, Arden, N.C., and Ardy Armen, Anderson, S.C., assignors to BASF Corporation, Parsippany, N.J.

Continuation of Ser. No. 860,658, Apr. 30, 1992, abandoned. This application Oct. 11, 1994, Ser. No. 321,471

Int. Cl.[6] D01D *10/02;* **D01F** *6/60*

U.S. Cl. 264—103 **31 Claims**



1. A continuous process for spinning and drawing polyamide filaments comprising the steps of:

(a) melting a polyamide and spinning filaments from the molten polyamide through a spinnerette;

(b) quenching the filaments;

(c) applying steam and heat to the filaments in a steam and heat unit by (i) passing the filaments along a looped path over and between a separated pair of godets, (ii) bringing the filaments passing along said looped path into proximity with a steam box positioned at a location between said separated pair of godets, (iii) directing steam from said steam box and onto the filaments in proximity therewith, and (iv) heating at least one of said godets so as to apply heat to the filaments passing thereover; and

(d) drawing the filaments.

5,487,861

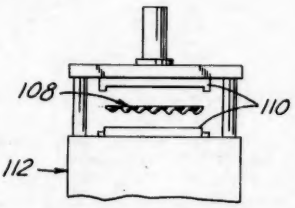
METHOD OF MAKING SYNTHETIC COMPOSITE FUEL METERING MEMBRANE

Michael F. Reeder, Cass City, and James E. Van Allen, Kingston, both of Mich., assignors to Walbro Corporation, Cass City, Mich.

Continuation of Ser. No. 116,282, Sep. 3, 1993, abandoned, which is a division of Ser. No. 9,558, Jan. 26, 1993, Pat. No. 5,262,092. This application Feb. 16, 1995, Ser. No. 390,810

Int. Cl.[6] B29B *15/14;* **B29C** *70/50*

U.S. Cl. 264—134 **23 Claims**



1. A method of making a liquid fuel synthetic composite and flexible carburetor diaphragm comprising the steps of:

providing a sheet of a fabric of warp knitted synthetic fibers having interstices therebetween, and a nominal thickness in the range of about 0.004 to 0.010 of an inch as determined per ASTM procedure D-1777,

tensioning the sheet into a taut condition,

applying a thin layer of an elastomeric polymer to only one side of the taut sheet to produce a coated sheet having a nominal thickness of about 0.012 to 0.018 of an inch,

placing the coated sheet into a mold,

while in the mold applying heat and pressure to the coated sheet to force the elastomeric polymer into the ilnterstices of the fabric, mold only one layer of the sheet to a desired configuration of the diaphragm which in cross section is not planar throughout and fully cure the elastomer to produce a molded diaphragm having a nominal thickness of about 0.007 to 0.010 of an inch, and

removing the molded and cured carburetor diaphragm from the mold.

5,487,862

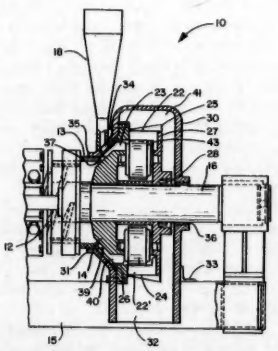
ANNULAR GAP EXPANDER PELLET FORMER AND PROCESS OF USING SAME

James D. Foresman, Hughesville, Pa., assignor to Andritz Sprout-Bauer, Inc., Muncy, Pa.

Filed May 18, 1994, Ser. No. 245,599

Int. Cl.[6] B29C *47/08*

U.S. Cl. 264—142 **29 Claims**



1. An annular gap expander with a pellet former, comprising:

a conditioning expander including a compression screw for conditioning feed material and a discharge end in which are situated a compression screw shaft, a first axially adjustable housing coaxially disposed around said compression screw and defining a discharge opening, a rotating member transversely mounted to said screw shaft near said first housing discharge opening thereby defining an annular extrusion gap between the rotating member and the discharge opening;

a second housing having an inlet port coaxially disposed around the discharge opening of said first axially adjustable housing for receiving expanded material from said annular extrusion gap, means for coaxially receiving said screw shaft, and a pellet outlet port;

a pellet die housed within and attached to said second housing, said pellet die being coaxial with said rotating member, and having an interior surface, an exterior surface, and a plurality of die bores extending radially between said surfaces;

a support plate situated in said second housing and rotatable by said screw shaft; and

a plurality of cut-off knives mounted in spaced apart relation on said support plate, said cut-off knives extending over said pellet die exterior surface to cut pellets as material emerges from said die exterior surface.

54. Method of forming a honeycomb structure from an extrudable material which comprises the steps

(a) flowing an extrudable material longitudinally through a plurality of feed passageways

(b) delivering such flow of material from said feed passageways directly to portions of a primary grid of interconnected discharge slots having exit apertures of substantially uniform width,

(c) delivering a portion of the flow of the primary grid to a secondary grid of interconnected discharge slots having exit apertures of substantially the same width as those of the primary grid, the slots of the secondary grid receiving extrudable material only from the slots of the primary grid, and

(d) longitudinally discharging said material from the aggregate of said slots to form a continuous thin walled honeycomb mass.

5,487,863

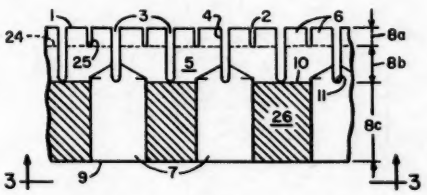
EXTRUSION DIE FOR PROTRUSION AND/OR HIGH CELL DENSITY CERAMIC HONEYCOMB STRUCTURES

George M. Cunningham, Horseheads; Rodney I. Frost, and Irwin M. Lachman, both of Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Continuation of Ser. No. 94,148, Sep. 8, 1987, Pat. No. 4,902,216. This application Jan. 30, 1989, Ser. No. 303,916

Int. Cl.[6] B29C *47/12*

U.S. Cl. 264—177.11 **60 Claims**



1. An extrusion die for forming honeycomb structures with intersecting cell walls from extrudable material, which comprises

a die body having an inlet face and an outlet face,

a plurality of feed holes extending within the body from the inlet face toward the outlet face,

the feed holes directly communicating only with each of a plurality of transversely crisscrossed primary discharge slots defined by a plurality of primary core members of the body and extending within the body from the outlet face toward the inlet face, with inner end portions of the feed holes communicating longitudinally and transversely in overlapping manner with inner end portions of the primary discharge slots, and

characterized by the improvement comprising secondary discharge slots extending within the primary core members from the outlet face toward the inlet face and into direct transverse communication with the primary discharge slots, the secondary discharge slots dividing the primary core members into secondary core members defining the secondary discharge slots, and said secondary discharge slots not directly communicating with said feed holes.

5,487,864

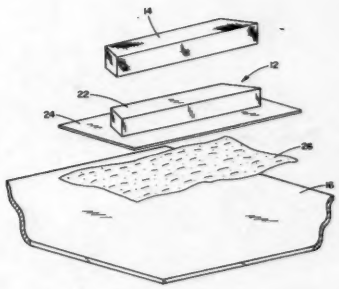
MOLDING COMPOSITE BY POSITIONING HEAT-CONDUCTIVE MAT BETWEEN PLATEN AND TOOL

Anthony R. Bartilucci, Wantagh; George W. Gilchrist, N. Massapequa, and Richard Yurman, Bethpage, all of N.Y., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Jul. 13, 1994, Ser. No. 274,248

Int. Cl.[6] B29C *33/40;39/20;51/10;* **B27N** *3/12*

U.S. Cl. 264—219 **8 Claims**



1. A method of manufacturing a composite article, comprising:

providing an autoclave having a platen;

applying a composite article onto a work tool;

positioning the work tool on the platen;

heating the platen to transfer heat from the platen to the work tool and from the work tool to the composite article to cure said article; and

positioning a heat conductive, flexible mat between the platen and the work tool to maintain a high thermal conductivity between the platen and the work tool during the heating step.

5,487,865

METHOD OF MAKING COMPLEX SHAPED METAL BODIES

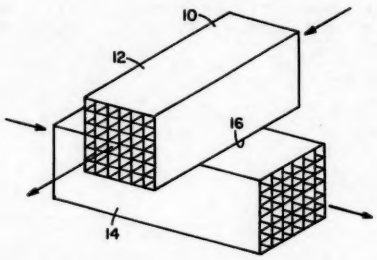
Leslie E. Hampton, Corning, N.Y., and David S. Weiss, Corning, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Division of Ser. No. 45,364, Apr. 8, 1993, abandoned. This application Sep. 2, 1994, Ser. No. 279,533

The portion of the term of this patent subsequent to Apr. 8, 2013, has been disclaimed.

Int. Cl.[6] **B22F** *3/10;5/10*

U.S. Cl. 419—5 **8 Claims**



1. A method of making a complex shaped body, said method comprising:

a) providing a plurality of green bodies, composed of one or more component metals, each body having an inlet end and an outlet end and having a multiplicity of cells extending from said inlet end to said outlet end;

b) forming an assembly of said green bodies; and

c) bonding the green bodies by a method consisting essentially of sintering said assembly at a temperature and time sufficient to cause interdiffusion of some of said one or more component metals and form a microscopically indistinguishable bond between the resulting sintered bodies to form a complex body.

5,487,866

Patent Not Issued For This Number

5,487,867

COPPER-BISMUTH CASTING ALLOYS

Akhileshwar R. Singh, Pepper Pike, Ohio, assignor to Federal-loy, Inc., Bedford, Ohio

Continuation-in-part of Ser. No. 63,435, May 18, 1993, Pat. No. 5,330,712, which is a continuation-in-part of Ser. No. 51,161, Apr. 22, 1993, abandoned. This application Feb. 14, 1994, Ser. No. 195,277

The portion of the term of this patent subsequent to Jul. 19, 2011, has been disclaimed.

Int. Cl.[6] **C22C** *9/02;9/04*

U.S. Cl. 420—471 **8 Claims**

1. A casting alloy consisting essentially of 75–77% copper, 2–3% tin, 5.5–7% bismuth, 13–17% zinc, 0.5–1% nickel and 0.1–1 mischmetal.

5,487,868

TIN BASED SOLDER ALLOY CONTAINING LEAD, ANTIMONY, AND TELLURIUM

Tetsuro Nishimura, Osaka, Japan, assignor to Nihon Superior Co., Ltd., Osaka, Japan

Filed Apr. 28, 1994, Ser. No. 234,067

Claims priority, application Japan, Mar. 9, 1994, 6-066676

Int. Cl.[6] **C22C** *13/00*

U.S. Cl. 420—559 **2 Claims**

1. A solder alloy comprising:

57–65% tin;

0.1 to 0.5% antimony;

0.002 to 0.05% tellurium;

0.001 to 0.05% gallium; and

the balance being lead, wherein all percentages are by weight.

5,487,869

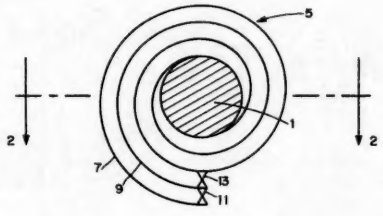
AIR CLEANER CAPABLE OF CATALYTIC REGENERATION

William B. Retallick, 1432 Johnny's Way, West Chester, Pa. 19382

Filed Sep. 24, 1993, Ser. No. 126,183

Int. Cl.[6] **A61L** *9/16;* **B01D** *50/00;* **F01N** *3/10*

U.S. Cl. 422—22 **29 Claims**



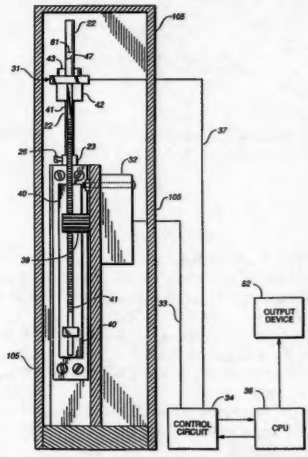
21. A method of removing impurities from air, the method comprising the steps of: a) directing air to be cleaned along a first path which passes through first and second support structures connected fluidly in series, the first support structure bearing a material which absorbs the impurities to be removed from the air, the second support structure bearing a combustion catalyst, wherein the impurities are absorbed by said material at ambient temperature, and

b) periodically regenerating the air cleaner by heating the support structures by passing an electric current through the support structures while directing air through a second path which is different from the first path, the second path extending through the support structures, so as to cause impurities which have been absorbed by said material to be evolved from the first support structure, and to cause catalytic burning of said impurities in said second support structure.

5,487,870
APPARATUS FOR SEDIMENTATION BASED BLOOD ANALYSIS

David K. McKinney; Milton E. Fuller, and Berry V. Carone, all of Reno, Nev., assignors to Solid State Farms, Inc., Reno, Nev.

Division of Ser. No. 512,845, Apr. 23, 1990, Pat. No. 5,328,822.
This application Jun. 13, 1994, Ser. No. 259,018
Int. Cl.[6] G01N *15/05*
U.S. Cl. 422—73 21 Claims



1. In an apparatus for determining the settling of erythrocyte cells from a plasma fluid in a test specimen of blood, said apparatus including a settling tube, sensing means mounted proximate said settling tube and sensing a characteristic of said test specimen during settling, control means responsive to said sensing means to cause said sensing means to follow a separation boundary between said erythrocyte cells and said plasma fluid during settling, and data sampling means responsive to at least one of said sensing means and said control means to sample data being sensed as to the settling of said erythrocyte cells; the improvement in said apparatus comprising:

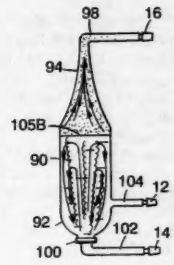
said sensing means sensing said characteristic at a rate greater than the rate of occurrence of settling of said specimen; and

said data sampling means being responsive to the occurrence of a predetermined change in height of said separation boundary wherein said sensing means includes means for generating and directing a beam of static radiation against said test specimen in a tracking zone located from a position proximate and below said separation boundary to a position up to said separation boundary.

5,487,871
MERCURY ASSAY

Timothy S. McDow, Palm Beach Gardens, and Marlin Bensinger, Lake Worth, both of Fla., assignors to LDC Analytical, Inc., Lake Worth, Fla.

Filed Oct. 30, 1992, Ser. No. 969,000
Int. Cl.[6] G01N *21/31*
U.S. Cl. 422—80 18 Claims



17. A cold vapor mercury assay system comprising

storage chamber structure of predetermined volume for storing a sample of material to be analyzed,

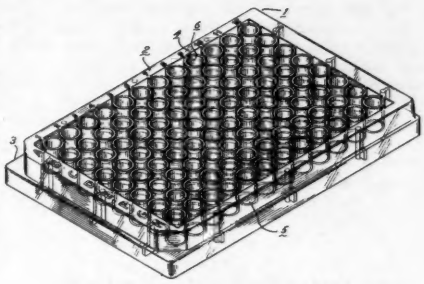
reaction chamber structure having first and second inlet ports and an outlet port, said reaction chamber structure including a body portion of cylindrical configuration to which said first inlet port is coupled for introduction of sample material to be an assayed in a direction tangential to the cylindrical inner surface of said body portion, a base portion of hemispherical configuration to which said second inlet port is coupled, and an upper portion of concave conical configuration to which an outlet port is coupled, and

mercury vapor analyzer apparatus coupled to said outlet port of said reaction chamber structure.

5,487,872
ULTRAVIOLET RADIATION TRANSPARENT MULTI-ASSAY PLATES

Dean G. Hafeman, Hillsborough, and Gillian M. K. Humphries, Los Altos, both of Calif., assignors to Molecular Device Corporation, Sunnyvale, Calif.

Filed Apr. 15, 1994, Ser. No. 228,415
Int. Cl.[6] B01L *3/00;11/00*
U.S. Cl. 422—102 2 Claims



1. A mid-UV transparent microplate comprising a frame with a plurality of parallel cylinders fixed in the frame, each cylinder defining a microplate well having a top and bottom opening, the bottom opening of each cylinder being sealed without leaking for holding liquid to be analyzed, with a portion of a substantially mid-UV transparent sheet material having an optical density of less than 0.4 OD from 250 nm to 750 nm, the mid UV transparent sheet material being selected from the group consisting of polyethylene and4-methylpentene-1 based polymer, the UV transparent material being in the form of a single sheet which is bonded to the bottom of each well, the microplate being characterized by an optical density variation between microplate wells of about a maximum of 0.02 OD (250 nm to 750 nm), the maximum thickness of the bottom being about 0.020 inches and the minimum thickness being about 0.015 inches, a minimum diameter of the cylinder is about 0.18 inches, a high resistivity to organic solvents and a temperature range of 15° to 45° C., with no optical degradation and 15° to 70° C. with no dimensional deformation, whereby said microplate will permit an accurate mid-UV light absorbance measurement of the liquid being analyzed.

5,487,873

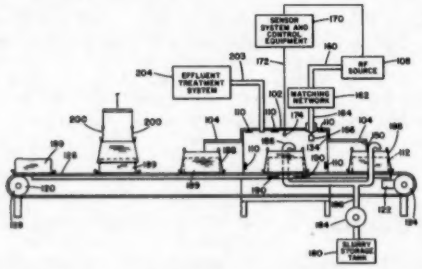
METHOD AND APPARATUS FOR TREATING HAZARDOUS WASTE OR OTHER HYDROCARBONACEOUS MATERIAL

Jack E. Bridges; Guggliam C. Sresty, both of Chicago, and Allen Taflove, Wilmette, all of Ill., assignors to IIT Research Institute, Chicago, Ill.

Continuation of Ser. No. 190,737, Feb. 2, 1994, abandoned, which is a continuation of Ser. No. 66,624, May 24, 1993, abandoned, which is a continuation of Ser. No. 938,304, Aug. 28, 1992, abandoned, which is a continuation of Ser. No. 502,322, Mar. 30, 1990, abandoned. This application Nov. 7, 1994, Ser. No. 335,190

Int. Cl.[6] B09B *3/00*

U.S. Cl. 588—212 **10 Claims**



10. A method for treating bulk hazardous waste comprising the steps of:

disposing bulk hazardous waste in an atmospheric pressure waste treatment region defined by the interior surface of a wall of a waste treatment chamber;

propagating radio frequency energy having a frequency in the range of about 500 kilohertz to about 100 megahertz through said radio frequency waste region, without ionizing gases within the waste treatment region, in order to heat the bulk hazardous waste by the radio frequency energy to evolve a hazardous vapor and to leave a residue;

maintaining the interior surface of the wall at least substantially as hot as the waste being treated to prevent the evolved hazardous vapor from condensing on said interior surface of said wall and recontaminatinq the residue;

collecting the hazardous vapor; and

storing the hazardous vapor.

5,487,874

AIR INTAKE SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

James W. Gibboney, Jr., Conyers, Ga., assignor to Scientific Products Corporation, Conyers, Ga.

Continuation-in-part of Ser. No. 889,167, May 27, 1992, Pat. No. 5,300,266. This application Mar. 30, 1994, Ser. No. 221,103

Int. Cl.[6] F02B *75/10;* **B01J** *19/08*

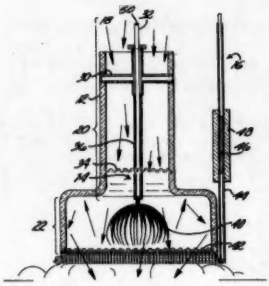
U.S. Cl. 422—186.03 **20 Claims**

1. Apparatus for supplying a mixture of combustion gas and fuel to an internal combustion engine, said apparatus for use with a source of combustion gas and a source of fuel, said apparatus comprising:

a housing having a first inlet for combustion gas from said source of combustion gas to enter said housing, a second inlet for fuel from said source of fuel to enter said housing, and an outlet in fluid connection with said engine;

means for mixing said combustion gas and said fuel, said mixing means positioned in said housing; and

means for generating negatively-charged molecules having the formula $[MO_x]^-$, where M is a positive ion of said electrically conducting material, O is oxygen, and x is a number ≥ 3, said generating means in fluid connection with said first inlet so that said negatively-charged molecules are mixed with combustion gas supplied to said mixing means.



5,487,875

MICROWAVE INTRODUCING DEVICE PROVIDED WITH AN ENDLESS CIRCULAR WAVEGUIDE AND PLASMA TREATING APPARATUS PROVIDED WITH SAID DEVICE

Nobumasa Suzuki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

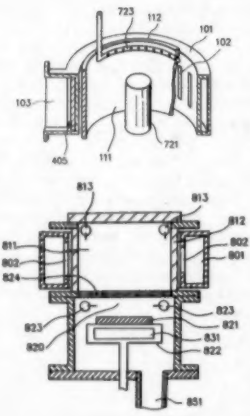
PCT No. PCT/JP92/01430, § 371 Date Jul. 6, 1993, § 102(e) Date Jul. 6, 1993

PCT Filed Nov. 5, 1992, Ser. No. 84,211

Claims priority, application Japan, Nov. 5, 1991, 3-315266; Nov. 8, 1991, 3-293010

Int. Cl.[6] H05H *1/46*

U.S. Cl. 422—186.05 **31 Claims**



1. A plasma treating apparatus comprising a substantially enclosed plasma generation chamber and a microwave introducing device disposed beside an exterior of said plasma generation chamber, wherein plasma is generated by applying a microwave into said plasma generation chamber through said microwave introducing device to generate plasma whereby treating an object positioned in said plasma generation chamber, wherein said microwave introducing device comprises an endless circular waveguide provided with a plurality of slots, said circular waveguide being provided with a microwave introducing portion connected to a microwave power source, and said plurality of slots being spacedly formed through an inner side of said circular waveguide such that the slots are arranged at said inner side of said circular waveguide at a given interval.

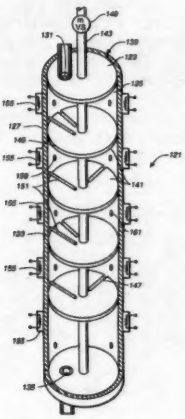
5,487,876
APPARATUS AND METHOD FOR CONTINUOUS SYNTHESIS OF VANADIUM OXIDE

Steven M. Mallinson, 446 Hassinger Rd., San Jose, Calif. 95111, and Michael E. McAleavey, 559 Gettysburg Dr., San Jose, Calif. 95123

Continuation of Ser. No. 104,306, Aug. 9, 1993, abandoned, which is a continuation of Ser. No. 42,356, Apr. 2, 1993, abandoned. This application Sep. 30, 1994, Ser. No. 312,973

Int. Cl.[6] F28D *21/00*

U.S. Cl. 422—205 28 Claims



1. An apparatus for the continuous synthesis of vanadium oxide from ammonium metavanadate, comprising:

one or more chamber wails defining an interior chamber of the apparatus, the interior chamber of the apparatus being sealed from an atmosphere surrounding the apparatus;

a source of ammonium metavanadate means for continuously introducing ammonium metavanadate from said source to the interior chamber of the apparatus through an inlet;

means for heating the interior chamber of the apparatus to a temperature of approximately 440° C.;

means for purging the interior chamber of the apparatus with an inert carrier gas to remove ammonia, water vapor, and oxygen that evolves from heated ammonium metavanadate;

means for continuously agitating ammonium metavanadate in the interior chamber of the apparatus while the interior chamber of the apparatus is heated by the heating means and while ammonia, water vapor, and oxygen are purged by the purging means such that ammonium metavanadate is uniformly exposed to heat and purging gas;

means for continuously removing vanadium oxide from the interior chamber of the apparatus through an outlet; and

means for continuously conveying the ammonium metavanadate and the vanadium oxide through the interior chamber of the apparatus from the introducing means to the removing means, the conveying means including one or more rotary trays that are arranged vertically between the introducing means and the outlet.

5,487,877
RESTROOM ORGANIZER AND STERILIZING APPARATUS

Min K. Choi, 14525 Memorial Dr., Houston, Tex. 77079

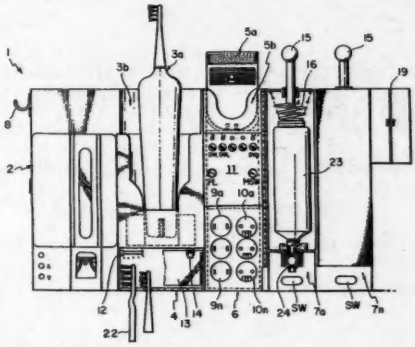
PCT No. PCT/US93/00885, § 371 Date Jul. 29, 1994, § 102(e) Date Jul. 29, 1994, PCT Pub. No. WO93/14668, PCT Pub. Date Aug. 5, 1993

PCT Filed Feb. 1, 1993, Ser. No. 256,990

Claims priority, application Rep. of Korea, Feb. 1, 1992, 1590; Jul. 1, 1992, 11676; Sep. 29, 1992, 18525

Int. Cl.[6] A45D *34/06;* A61L *2/10;2/24*

U.S. Cl. 422—300 17 Claims



1. A sterilization apparatus, comprising:

a main block;

a means for sterilization attached within the main block wherein said sterilization means comprises an ultraviolet light;

a reflection surface connected within the main block;

a means for controlling said sterilization means; and

a removable storage case mounted within said main block, having a main body which defines at least two storage compartments and having a means for holding water dripping from the storage compartments which fits over said main body.

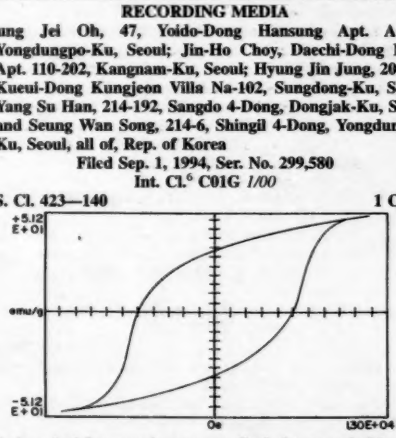
5,487,878
METHOD FOR PREPARING PERPENDICULARLY MAGNETIZABLE MATERIAL USABLE ON MAGNETIC RECORDING MEDIA

Young Jei Oh, 47, Yoido-Dong Hansung Apt. A-805, Yongdungpo-Ku, Seoul; Jin-Ho Choy, Daechi-Dong Mido Apt. 110-202, Kangnam-Ku, Seoul; Hyung Jin Jung, 208-22, Kueui-Dong Kungjeon Villa Na-102, Sungdong-Ku, Seoul; Yang Su Han, 214-192, Sangdo 4-Dong, Dongjak-Ku, Seoul, and Seung Wan Song, 214-6, Shingil 4-Dong, Yongdungpo-Ku, Seoul, all of, Rep. of Korea

Filed Sep. 1, 1994, Ser. No. 299,580

Int. Cl.[6] C01G *1/00*

U.S. Cl. 423—140 1 Claim



1. A method for preparing a perpendicularly magnetizable material usable on magnetic recording media, comprising the steps of:

dissolving at least one member of the group consisting of strontium chloride and strontium nitrate with at least one

member of the group consisting of iron chloride and iron nitrate in distilled water;

adding citric acid to the resultant solution;

controlling the pH of the solution to a range sufficient to completely dissociate the citric acid;

heating the resultant solution with stirring to yield a gelatinous precursor;

subjecting the precursor to a temperature sufficiently high to remove the organic constituents thereof; and

calcining the precursor under conditions sufficient to provide a perpendicularly magnetizable material.

5,487,879

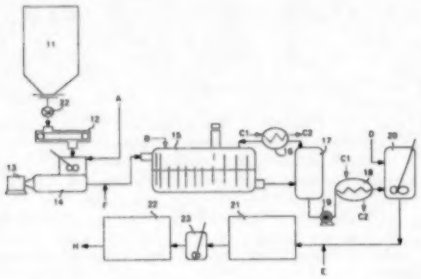
STABILIZED, PRESSURE-HYDRATED MAGNESIUM HYDROXIDE SLURRY FROM BURNT MAGNESITE AND PROCESS FOR ITS PRODUCTION

Joseph T. Witkowski, Baltimore, Md.; David M. Smith, Kearneysville, W. Va., and Mark T. Wajer, Baltimore, Md., assignors to Martin Marietta Magnesia Specialities Inc., Raleigh, N.C.

Filed Jul. 15, 1994, Ser. No. 275,473

Int. Cl.[6] C01F *5/14*

U.S. Cl. 423—155 **16 Claims**



1. A process for the production of a stabilized magnesium hydroxide slurry comprising the steps of:

pressure hydrating a mixture comprising burnt natural magnesite and water to provide a precursory pressure hydrated magnesium hydroxide slurry;

providing chloride ions and cationic polymer;

deagglomerating said precursory pressure hydrated magnesium hydroxide slurry in the presence of said chloride ions and cationic polymer to provide a deagglomerated and stabilized magnesium hydroxide slurry comprising from 50 to 65 weight % solids.

5,487,880

PRODUCTION OF SODIUM-22 FROM PROTON IRRADIATED ALUMINUM

Wayne A. Taylor; Richard C. Heaton, and David J. Jamriska, all of Los Alamos, N.M., assignors to The Regents of the Unviersity of California Office of Technology Transfer, Alameda, Calif.

Filed Nov. 30, 1993, Ser. No. 160,601

Int. Cl.[6] C01G *57/00*

U.S. Cl. 423—2 **5 Claims**

1. A process for selective separation of sodium-22 from a proton irradiated aluminum target comprising:

dissolving a proton irradiated aluminum target to form a first solution including aluminum ions and sodium ions;

separating a portion of the aluminum ions from the first solution by crystallization of an aluminum salt;

contacting the remaining first solution with an anion exchange resin whereby ions selected from the group consisting of iron and copper are selectively absorbed by the anion exchange resin while aluminum ions and sodium ions remain in solution;

contacting the solution with an cation exchange resin whereby aluminum ions and sodium ions are adsorbed by the cation exchange resin; and,

contacting the cation exchange resin with an acid solution capable of selectively separating the adsorbed sodium ions from the cation exchange resin while aluminum ions remain adsorbed on the cation exchange resin.

5,487,881

PROCESS OF PRODUCING CHLORINE DIOXIDE

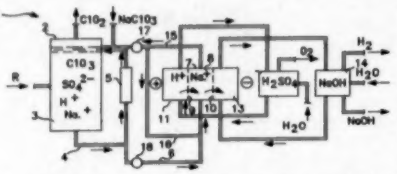
Helena Falgén; Göran Sundström; Johan Landfors, all of Sundsvall, Sweden, and John C. Sokol, Marietta, Ga., assignors to EKA Nobel Inc., Marietta, Ga.

Continuation-in-part of Ser. No. 23,561, Feb. 26, 1993, Pat. No. 5,380,517. This application Sep. 15, 1993, Ser. No. 120,814

Claims priority, application Sweden, Jul. 2, 1993, 9302279

Int. Cl.[6] C01B *11/02*

U.S. Cl. 423—478 **18 Claims**



1. A process for producing chlorine dioxide, comprising the steps of:

(a) providing a reactor with an aqueous acidic reaction medium containing alkali metal chlorate and sulfate, wherein the concentration of sulfate exceeds about 3 moles/l but is less than saturation;

(b) reducing chlorate ions in said reaction medium to form chlorine dioxide;

(c) withdrawing chlorine dioxide gas from the reaction medium;

(d) withdrawing reaction medium from the reactor and transferring it to an electrochemical cell;

(e) electrolyzing said reaction medium to increase the acidity and decrease the content of alkali metal ions;

(f) recycling the acidified reaction medium to the reactor; and

(g) adding make-up alkali metal chlorate to the reaction medium upstream or downstream of the electrochemical cell;

wherein the process is conducted under non-crystallizing conditions.

5,487,882

PROCESS FOR PREPARATION OF ZEOLITE "X"

Patrick C. Hu, and Eric W. Liimatta, both of Baton Rouge, La., assignors to Albemarle Corporation, Richmond, Va.

Filed Jul. 19, 1994, Ser. No. 275,722

Int. Cl.[6] C01B *39/22*

U.S. Cl. 423—700 **4 Claims**

1. A method for producing a crystalline synthetic faujasite of the zeolite "X" type comprising the steps of:

i) separately preparing a sodium silicate solution and a sodium aluminate solution;

ii) admixing the sodium silicate solution and the sodium aluminate solution at high shear until a mixture results having a ratio of sodium oxide to silica of 0.4:1 to 2:1; silica to alumina of 2.2:1 to 3.5:1; and water to sodium oxide of 20:1 to 70:1;

iii) heating said mixture to a temperature of about 80° to 120° C. in the absence of any further mixing for a period of time sufficient to produce the desired crystalline faujasite of the zeolite "X" type; and

iv) recovering said zeolite "X".

5,487,883

PROCESS FOR PRODUCING MOXAS

Tae W. Yoo, 807, 1-Dong, Hanyang, Apt. 32-5, Banpo-dong, Seocho-ku, Seoul, Rep. of Korea

Filed Oct. 7, 1994, Ser. No. 319,962

Claims priority, application Rep. of Korea, Dec. 8, 1993, 93-26782

Int. Cl.[6] A01N *25/06;25/18;25/20*

U.S. Cl. 424—40 **18 Claims**

1. A process for producing moxas comprising the step of mixing 90 weight % of carbonized wormwood powder with 3–7 weight % of ceramic powder and 3–7 weight % of powder of Sabina Chinensis.

5,487,884

PHOTOPROTECTION COMPOSITIONS COMPRISING CHELATING AGENTS

Donald L. Bissett, Hamilton; Rodney D. Bush, Cincinnati, and Ranjit Chatterjee, Fairfield, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 619,805, Nov. 27, 1990, abandoned, which is a continuation of Ser. No. 251,910, Oct. 4, 1988, abandoned, which is a continuation-in-part of Ser. No. 112,576, Oct. 22, 1987, abandoned. This application Jul. 1, 1993, Ser. No. 86,757

Int. Cl.[6] A61K *7/06;7/42;7/48;7/50*

U.S. Cl. 424—59 **25 Claims**

1. A method of inhibiting the deleterious effects of chronic ultraviolet light exposure to skin, such deleterious effects including one or more of skin cancer or premature aging as characterized by skin wrinkling, skin yellowing, skin cracking, telangiectasis, solar keratoses, ecchymoses, or lack of elasticity, comprising applying to the skin, prior to exposing the skin to ultraviolet light, a safe and photoprotectively effective amount of a nonsunscreen chelating agent selected from the group consisting of 2,2'-dipyridylamine; 1,10-phenanthroline; di-2-pyridylketone; 2-furildioxime; 2,3-bis(2-pyridyl)pyrazine; 1 -hydroxy- 4-methyl-6-(2,4,4-trimethylpentyl)-2(1 H)-pyridone; 2,3-dihydroxybenzoic acid; ethylenediamine-N,N-bis(2-hydroxyphenylacetic acid), dimethyl ester; 1,1'-carbonyldiimidazole; 1,2-dimethyl- 3-hydroxypyrid-4-one; 2,4,6-tri(2-pyridyl)- 1,3,5-triazine; 1-pyrrolidinecarbodithioic acid; diethyldithiocarbamic acid; 6-cyclohexyl-1-hydroxy- 4-methyl-2(1H)-pyridinone; 2,2'-dipyridyl; 1,2-cyclohexanedione dioxime; 3-hydroxy-2-methyl-4-pyrone; 2,3-bis(2-pyridyl)-5,6-dihydropyrazine; 3-(4-phenyl- 2-pyridyl)-5-phenyl-1,2,4-triazine; 5-hydroxy- 2-(hydroxymethyl)-4H-pyran-4-one; 2,3-dihydroxypyridine; 2,2'-biquinoline; 2,2 '-bipyrazine; 3-(2-pyridyl)-5,6-diphenyl-1,2,4-triazine; 4,4'-dimethyl-2,2'-dipyridyl; 4,5-dihydroxy-1,3-benzene-disulfonic acid; phenyl 2-pyridyl ketoxime; desferrioxamine B; 5,7-dichloro-8-hydroxyquinoline; 2,3-dihydroxynaphthalene; 2,3,5,6-tetrakis-(2'-pyridyl)pyrazine; 2,4-bis(5,6-diphenyl-1,2,4-triazine-3-yl)pyridine; di- 2-pyridyl glyoxal; 6-hydroxy-2-phenyl-3(2 H)-pyridazinone; 2,4-pteridinediol; 3-(4-phenyl- 2-pyridyl)-5,6-diphenyl-1,2,4-triazine; N-benzoyl-N-phenylhydroxylamine; 3-amino-5,6-dimethyl-1,2,4-triazine; 2,6-pyridinedicarboxylic acid; 2,4,5-trihydroxypyrimidine; and 4-(2-amino- 1-hydroxyethyl)-1,2-benzenediol.

5,487,885

SUNBLOCKING POLYMERS AND THEIR FORMULATION

Milos Sovak, La Jolla; Ronald C. Terry; James G. Douglass, III, both of San Diego, and Farid Bakir, Del Mar, all of Calif., assignors to Biophysica, Inc., La Jolla, Calif.

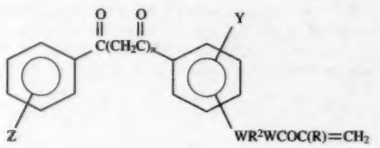
Continuation-in-part of Ser. No. 994,426, Dec. 21, 1992, abandoned. This application Dec. 9, 1993, Ser. No. 164,881

Int. Cl.[6] A61K *31/78;7/42*

U.S. Cl. 424—59 **5 Claims**

1. A polyacrylic acid based sunscreen composition having as its UV absorbing moieties:

for UV-A, a compound of the formula:



wherein:

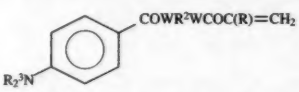
n is 0 or 1;

Z is oxy or amino of not more than about than about 12 carbon atoms;

Y is non-oxo carbonyl of not more than about 12 carbon atoms; and

W is oxy or amino;

for UV-B, a compound of the formula:



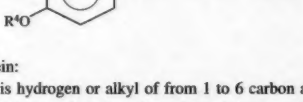
wherein:

R^2 is hydrogen or alkyl of up to 6 carbon atoms;

R^3 is a divalent hydrocarbylene group;

W and R are as defined above:

for UV-C, a compound of the formula:



wherein:

R^4 is hydrogen or alkyl of from 1 to 6 carbon atoms; and

the other symbols have been defined above; and an oxyaliphatic substituted acrylic acid of the formula:

$$R^5WCOC(R)=CH_2$$

wherein R^5 is an aliphatic group of from 1 to 4 carbon atoms having from 1 to 3 oxy groups, wherein the other symbols have been defined previously; and

the polymer is insoluble in water and swellable in a polyethylene glycol-water composition comprising from about 50– 95% polyethylene glycol.

5,487,886

AMINO ACID β-LYASE ENZYME INHIBITORS AS DEODORANTS

Sue B. Lyon, Bethesda; Clifford O'Neal, Gaithersburg; Hermes Van Der Lee, Olney, all of Md., and Brian Rogers, South Boston, Mass., assignors to The Gillette Company

Division of Ser. No. 985,851, Dec. 4, 1992, which is a continuation of Ser. No. 824,886, Jan. 22, 1992, Pat. No. 5,213,791, which is a continuation of Ser. No. 418,876, Oct. 10, 1989, abandoned. This application Mar. 29, 1994, Ser. No. 219,341

Int. Cl.[6] A61K *7/32;7/34;7/38;9/12*

U.S. Cl. 424—65 **6 Claims**

1. A deodorant composition comprising a body odor suppressing effective amount of an inhibitor of an amino acid β-lyase enzyme containing the cofactor pyridoxal phosphate and which cleaves amino acids with the structure $COOH—CH(NH_2)—CH_2—S—R$ where R is alkyl, wherein the inhibitor is a compound of the formula

$$NH_2—C(CH_3)(COOH)—CH_2SR$$

where R is a hydrogen, phenyl; C_1–C_8 alkyl which is unsubstituted or substituted by a phenyl group, a hydroxy group, a benzyloxy or benzyloxycarbonyl group, a halogen or an amine group, in a dermatologically acceptable vehicle.

5,487,887

CLEAR ANTIPERSPIRANT ROLL-ON COMPOSITIONS

Anthony Benfatto, North Brunswick, N.J., assignor to Bristol-Myers Squibb Company, New York, N.Y.

Filed Oct. 28, 1993, Ser. No. 144,777

Int. Cl.[6] A61K *7/34;7/38;9/10;9/107*

U.S. Cl. 424—66 **26 Claims**

1. A clear, low residue antiperspirant composition comprising on a weight basis from about 5 to about 30% antiperspirant active; from about 5 to about 25% PEG-7-glyceryl cocoate; from about 0.5 to about 3% emollient; from about 3 to about 7% cyclomethicone and from about 35 to 60% water, said antiperspirant composition being in the form of an oil-in-water microemulsion.

5,487,888

IRON-BINDING POLYMERS FOR ORAL ADMINISTRATION

W. Harry Mandeville, III, Lynnfield, and Stephen R. Holmes-Farley, Arlington, all of Mass., assignors to GelTex, Inc., Waltham, Mass.

Filed May 20, 1993, Ser. No. 65,546

Int. Cl.[6] A61K *31/785*

U.S. Cl. 424—78.1 **19 Claims**

1. A method of reducing dietary iron absorption in a patient in need thereof comprising orally administering to said patient a therapeutically effective amount of at least one polymer that binds dietary iron in vivo, said polymer being non-toxic and stable once ingested.

5,487,889

BANDAGE FOR CONTINUOUS APPLICATION OF BIOLOGICALS

Richard L. Eckert, Cleveland Heights; Daniel J. Smith, Stow, and Irwin Schafer, Brutenahl, all of Ohio, assignors to The MetroHealth System, The University of Akron, and Case Western Reserve University, both of Cleveland, Ohio

Continuation-in-part of Ser. No. 893,164, Jun. 3, 1992, abandoned. This application Aug. 13, 1993, Ser. No. 106,165

Int. Cl.[6] A61F *13/00;* **C12N** *15/00;* **A61K** *38/18*

U.S. Cl. 424—93.1 **31 Claims**

1. A kit for forming a bandage, containing cells that secrete a wound healing factor comprising:

a. a container containing cells that secrete a wound healing factor; and

b. a bandage comprising:

i. a first membrane, being gas permeable and fluid impermeable, and

ii. a second membrane, being permeable to the wound healing factor, said first and second membranes each having a perimeter, and being joined at the perimeter so as to define a chamber for receiving said cells.

5,487,890

MAMMALIAN PRIMATE ERYTHROCYTE BOUND HETEROPOLYMERIZED MONOCLONAL ANTIBODIES AND METHODS OF USE THEREOF

Ronald P. Taylor, Charlottesville; William M. Sutherland, Earlysville; Craig Reist, Charlottesville; Eleanor L. Wright, Earlysville; Donna Webb, Charlottesville, and Ronald Labuguen, Charlottesville, all of Va., assignors to University of Virginia Patent Foundation, Charlottesville, Va.

Continuation of Ser. No. 161,812, Dec. 6, 1993, which is a continuation of Ser. No. 592,801, Oct. 4, 1990, abandoned. This application Jan. 24, 1994, Ser. No. 186,136

The portion of the term of this patent subsequent to Nov. 28, 2012, has been disclaimed.

Int. Cl.[6] A61K *39/395;39/40;39/42*

U.S. Cl. 424—136.1 **6 Claims**

1. A method of therapeutically treating a primate individual with a target antigen present in its circulatory system, said target antigen being selected from the group consisting of a virus, a microorganism and a protein, comprising administering to said individual a therapeutically effective amount of a monoclonal antibody heteropolymer comprising a first monoclonal antibody specific for CR1 receptor cites on the surface of erythrocytes of said individual, said first monoclonal antibody being cross-linked to a second monoclonal antibody specific for said target antigen.

5,487,891

HUMAN ANTI-RH(D) MONOCLONAL ANTIBODIES REAGENTS AND HYBRIDOMAS AND METHODS OF RH TYPING USING ANTI-RH(D) MONOCLONAL ANTIBODIES AND REAGENTS

Benjamin A. D. B. Bradley, Winterbourne Down; Alan Doyle, Salisbury, and Belinda M. Kumpel, Bristol, all of, England, assignors to National Blood Authority, Watford, England

Continuation of Ser. No. 469,516, Apr. 3, 1990, abandoned. This application May 6, 1993, Ser. No. 57,560

Claims priority, application United Kingdom, Sep. 18, 1987, 8722018

Int. Cl.[6] A61K *39/395;* **C07K** *16/34;* **C12N** *5/22;* **G01N** *33/53*

U.S. Cl. 424—142.1 **27 Claims**

1. A human monoclonal antibody having the following essential characteristics:

(a) binding to Rh(D) antigen, but not C, c, E or e antigens of the Rh blood group system;

(b) being IgG 1 proteins;

(c) having kappa light chains;

(d) being Glm(3) allotype;

(e) binding to D^u cells by the indirect antiglobulin test;

(f) binding to D^{IV}, D^V and $D^{Tar}(D^{VII})$ variant antigens; and

(g) not binding to D^{VI} or D^B variant antigens, and antigen-binding fragments thereof.

5,487,892

METHOD FOR TREATING THROMBOTIC DISEASE USING A FIBRIN SPECIFIC MONOCLONAL ANTIBODY

Paul E. Gargan, South Bend, Ind., assignor to American Biogenetic Sciences, Inc., Copiague, N.Y.

Filed Feb. 24, 1994, Ser. No. 204,015
Int. Cl.[6] A61K *39/395*; C07K *16/18*
U.S. Cl. 424—145.1 26 Claims

1. A method for reducing the rate of fibrin deposition in a human, comprising administering to a human in need of said reduction an effective amount of the fibrin-specific monoclonal antibody MH-1 produced by hybridoma ATCC 9739, or an antibody that binds to the same epitope as monoclonal antibody MH-1.

5,487,893

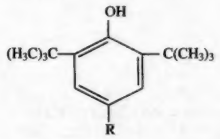
ANTIVIRAL USE OF A 2,6-DI-T-BUTYLPHENOL COMPOUND SUBSTITUTED IN 4 POSITION AGAINST HERPES VIRUSES AND PAPILLOMAVIRUSES

Robert Vachy, Paris, France, assignor to Fileco, Paris, France

PCT No. PCT/FR91/00882, § 371 Date Aug. 2, 1993, § 102(e) Date Aug. 2, 1993, PCT Pub. No. WO92/08450, PCT Pub. Date May 29, 1992
PCT Filed Nov. 12, 1991, Ser. No. 50,279
Claims priority, application France, Nov. 12, 1990, 90 13984; Feb. 20, 1991, 91 02028
Int. Cl.[6] A61K *35/78;31/235;31/19;31/11;31/05*
U.S. Cl. 424—195.1 16 Claims

1. An antiviral composition comprising a substituted phenol selected from the group consisting of:

(a) phenols having the formula



where R is CH_2OH, CHO, or COOH, and

(b) their corresponding salts and alkyl esters thereof where alkyl is C1–C5 when R is COOH [or A—COOH], wherein the phenol is in an effective antiviral amount, and a physiologically acceptable excipient.

5,487,894

COMPOSITION OF DEHYDRATED POWDERED MUNG BEAN SPROUT AND PLANT FIBER FOR USE AS DIETARY SUPPLEMENT IN HEALTHCARE

Joseph Kovacs, 22 Ch. Du Pommier, 1218 Geneva, Switzerland

Filed Dec. 19, 1994, Ser. No. 358,367
Int. Cl.[6] A61K *35/78*
U.S. Cl. 424—195.1 33 Claims

1. A dietary supplement composition comprising dehydrated powdered mung bean sprout and oat groats.

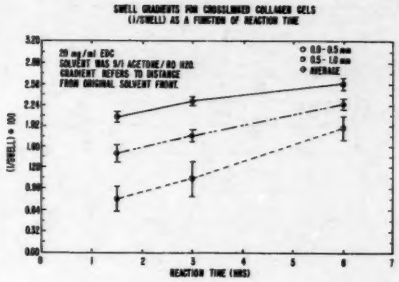
5,487,895

METHOD FOR FORMING CONTROLLED RELEASE POLYMERIC SUBSTRATE

Gregory S. Dapper, Newark, and Ronald K. Yamamoto, San Francisco, both of Calif., assignors to Vitaphore Corporation, Plainsboro, N.J.

Filed Aug. 13, 1993, Ser. No. 106,342
Int. Cl.[6] A61K *39/00;9/52*
U.S. Cl. 424—278.1 23 Claims

1. A method of forming a controlled release polymer substrate comprising the steps of:


SWELL GRADIENTS FOR CROSSLINKED COLLAGEN GELS
(I/SWELL) AS A FUNCTION OF REACTION TIME
20 mg/ml EDC
SOLVENT WAS 5/1 ACETONE/80 H2O.
GRADIENT REFERS TO DISTANCE
FROM ORIGINAL SOLVENT FRONT.
0.0 - 0.5 mm
0.5 - 1.0 mm
AVERAGE
(I/SWELL) * 100
REACTION TIME (HRS)

a) providing a water-swellable polymeric substrate;

b) contacting said substrate, or a portion thereof, with a liquid mixture containing a cross-linking agent which is at least partially soluble in said liquid mixture comprising water and an organic liquid, for a period of time and at a temperature and concentration of said agent sufficient for said agent to penetrate a surface of said substrate in contact with said mixture, to form cross-linking bridges in said substrate in a decreasing concentration gradient beneath said surface;

c) contacting said substrate with a bioactive agent which is absorbed into said substrate.

5,487,896

ANTIMICROBIAL GLOVE COMPRISING A RAPID RELEASE MATRIX SYSTEM FOR ANTIINFECTIVE AGENT DELIVERY

Shanta Modak, River Edge, N.J., and Lester Sampath, Nyack, N.Y., assignors to Trustees of Columbia University In The City of New York, New York, N.Y.

Filed May 12, 1994, Ser. No. 241,474
Int. Cl.[6] A61K *7/043*
U.S. Cl. 424—402 16 Claims

1. An antimicrobial glove comprising chlorhexidine in a bilayer which comprises a latex/chlorhexidine matrix layer, and a starch/chlorhexidine matrix layer wherein the starch/chlorhexidine matrix comprises between 200 mg and 500 mg of starch and between 8 and 20 mg of chlorhexidine gluconate, the antimicrobial glove providing effective antimicrobial action which is releasable within between 30 seconds and 1 minute of exposure to liquid.

5,487,897

BIODEGRADABLE IMPLANT PRECURSOR

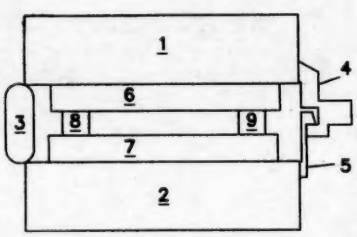
Alan M. Polson; Deryl D. Swanbom; Richard L. Dunn; Charles P. Cox; Richard L. Norton; Bryan K. Lowe, and Kenneth S. Peterson, all of Fort Collins, Colo., assignors to Atrix Laboratories, Inc., Fort Collins, Colo.

Continuation-in-part of Ser. No. 783,512, Oct. 29, 1991, Pat. No. 5,324,519, which is a continuation-in-part of Ser. No. 384,416, Jul. 24, 1989, Pat. No. 5,077,049. This application Sep. 28, 1993, Ser. No. 127,642
Int. Cl.[6] A61F *2/00*
U.S. Cl. 424—426 39 Claims

1. An implant precursor for implantation in a tissue defect in an animal, comprising:

a two-part structure composed of an outer sac and a liquid content; the implant precursor comprising a mixture of a biocompatible, biodegradable, water-coagulable thermoplastic polymer, and a pharmaceutically-acceptable, water-soluble organic solvent;

wherein the implant precursor is capable of reverting to an all liquid form if the implant precursor is not contacted by an aqueous medium.



5,487,898

COMPOSITIONS AND METHOD FOR THE SUBLINGUAL OR BUCCAL ADMINISTRATION THERAPEUTIC AGENTS

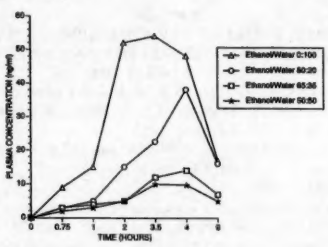
Mou-Ying F. Lu, Lake Bluff, and Thomas L. Reiland, Gages Lake, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 983,111, Nov. 30, 1992, Pat. No. 5,284,657, which is a continuation of Ser. No. 750,843, Aug. 26, 1991, abandoned. This application Feb. 7, 1994, Ser. No. 193,374

The portion of the term of this patent subsequent to Feb. 8, 2011, has been disclaimed.

Int. Cl.[6] **A61K** *38/09;* **C07K** *7/23;17/04;17/12*

U.S. Cl. 424—435 **13 Claims**



1. A pharmaceutical composition for the sublingual or buccal administration of a peptide or modified peptide, said modified peptides modified by incorporation of non-naturally occurring amino acid residues, said peptides and modified peptides of twenty amino acids or less, comprising

a) from about 1 to about 100 mg/ml of said peptide or modified peptide,

b) a pharmaceutically acceptable carrier comprising a solvent system comprising from about 20 percent w/v to about 95% w/v of a non-toxic alcohol and from about 0.5% w/v to about 50% w/v of an oral mucosal membrane enhancing agent; said percentages based upon the total volume of career;

with the proviso that said peptide or modified peptide is not leuprolide.

5,487,899

WOUND HEALING

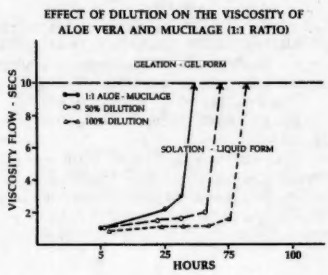
Robert H. Davis, King of Prussia, Pa., assignor to Jess Clarke & Sons, Inc., Westport, Conn.

Filed Jan. 31, 1994, Ser. No. 190,330

Int. Cl.[6] **A61K** *9/70*

U.S. Cl. 424—443 **8 Claims**

1. A method for the therapeutic treatment of open wounds in animals that comprises: (1) adding a first wound-healing composition to an open wound, and (2) overlaying the first wound-healing composition with a bandaging mixture comprising about a 1:1 ratio of whole leaf Aloe vera and Aloe vera mucilage.


EFFECT OF DILUTION ON THE VISCOSITY OF ALOE VERA AND MUCILAGE (1:1 RATIO)
GELATION - GEL FORM
1:1 ALOE - MUCILAGE
50% DILUTION
100% DILUTION
SOLATION - LIQUID FORM
VISCOSITY FLOW - SECS
HOURS

5,487,900

STABILIZED VITAMIN D PREPARATION

Hiroki Itoh, Takarazuka; Tetsuro Tabata, and Jun-Ichi Kikuta, both of Osaka, all of, Japan, assignors to Takeda Chemical Industries, Limited, Osaka, Japan

Continuation of Ser. No. 865,613, Apr. 9, 1992, abandoned. This application Feb. 7, 1994, Ser. No. 193,650

Claims priority, application Japan, Apr. 9, 1991, 3-076210; Feb. 4, 1992, 4-019099

Int. Cl.[6] **A61K** *9/48*

U.S. Cl. 424—451 **17 Claims**

1. A composition of a heat-labile active vitamin D_2 compound, which comprises an aqueous solution of a heat-labile active vitamin D_2 compound being dispersed in a basic polymer selected from the group consisting of vinyl acetate polymers and acrylic acid copolymers, wherein the aqueous solution has a pH of about 8.0 to 13.0.

5,487,901

PROCESS FOR PREPARING PHARMACEUTICAL TABLET CAPABLE OF RELEASING THE ACTIVE INGREDIENTS CONTAINED THEREIN AT SUBSEQUENT TIMES

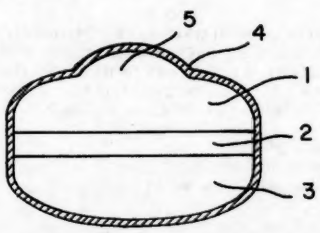
Ubaldo Conte, Busto Arisizio; Aldo La Manna, and Lauretta Maggi, both of Pavia, all of, Italy, assignors to Ekita Investments N.V., Curacao, Netherlands Antilles

Filed May 24, 1994, Ser. No. 248,338

Claims priority, application Italy, May 31, 1993, MI93A1120

Int. Cl.[6] **A61K** *9/22*

U.S. Cl. 424—472 **10 Claims**



1. Process for the preparation of a pharmaceutical tablet containing one or more drugs, capable of releasing said drugs at subsequent times, said tablet comprising upper, intermediate and lower superposed layers, said upper layer comprising a drug which is formulated to provide for the immediate release of said drug upon contact with aqueous fluids; said intermediate layer being formulated without any drug but being formulated to slowly erode or dissolve upon contact with aqueous fluids; and said lower layer comprising a drug which is the same as the drug in said upper layer or which is different from the drug in said upper layer and is also formulated to provide for the immediate release of said drug upon contact with aqueous fluids, said process comprising:

(a) preparing a tablet having said upper, intermediate and lower layers wherein either of said upper or lower layers has an elevated portion of the outer surface which is elevated with respect with the other portion of said outer surface;

(b) coating the surface of the tablet of step (a) with a polymeric film which is impermeable to aqueous fluids;

(c) removing, by abrasion, said elevated portion of the outer surface of either of said upper or lower layers to allow contact of said upper or lower layer with the environment; and

(d) coating the tablet obtained in step (c) with a polymeric material which is soluble in aqueous fluids.

5,487,902

CHEWING GUM COMPOSITION WITH ACCELERATED, CONTROLLED RELEASE OF ACTIVE AGENTS

Carsten Andersen, Vejle, and Morten Pedersen, Rådovre, both of, Denmark, assignors to Fertin Laboratories Ltd. (Dansk Tyggegummi Fabrik A/S), Vejle, Denmark

Continuation of Ser. No. 820,687, Feb. 12, 1992, abandoned. This application Sep. 19, 1994, Ser. No. 308,620

Claims priority, application Denmark, Jul. 24, 1989, 3653/89

Int. Cl.[6] A23G *3/30*

U.S. Cl. 426—3 **16 Claims**

1. Chewing gum composition with accelerated, controlled release of substantially fat-soluble active agents, produced by combining

i) a chewing gum base having a resin component, wherein said resin component of the chewing gum base comprises at least 25 weight % of a resin selected from the group consisting of terpene resins, glycerol ester of polymerized rosin, pentaerythritol ester of wood or gum rosin, pentaerythritol ester of partially hydrogenated wood or gum rosin, glycerol ester of partially hydrogenated wood or gum rosin, and high molecular weight polyvinyl acetate resins with a molecular weight of at least 30,000, with

ii) one or more substantially fat-soluble active agents, additives, and at least one solubilizer in a quantity of 1–10 weight %, said solubilizer having an HLB value of 14–20.

5,487,903

METHOD FOR IMPROVING THE QUALITIES OF MEAT AND MEAT PIECE TREATED THEREBY

Takaaki Yokoyama; Hirotaka Sasaki; Yumiko Ohno, all of Ibaraki; Kentaro Nakajima, Chiba; Yasuhiro Miura, and Hideki Mori, both of Ibaraki, all of, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Dec. 19, 1994, Ser. No. 358,308

Claims priority, application Japan, Dec. 17, 1993, 5-343815; Jan. 18, 1994, 6-017932

Int. Cl.[6] A23L *1/318*

U.S. Cl. 426—56 **22 Claims**

1. A method for improving the qualities of meat which comprises treating a meat piece with an ester represented by the following formula (1):

(1)

wherein one of R^1 and R^2 represents a saturated or unsaturated monocarboxylic acid residue having 2 to 24 carbon atoms while the other represents a dicarboxylic acid residue.

5,487,904

BEVERAGE BASE OF COCOA COATED SUGAR GRAINS

William G. Caly, Jougne, France, assignor to Nestec S.A., Vevey, Switzerland

Continuation of Ser. No. 846,595, Mar. 5, 1992, Pat. No. 5,338,555. This application May 24, 1994, Ser. No. 248,323

Claims priority, application European Pat. Off., Mar. 28, 1991, 91104934

The portion of the term of this patent subsequent to Aug. 16, 2011, has been disclaimed.

Int. Cl.[6] A23C *9/156;* **A23G** *1/00*

U.S. Cl. 426—96 **17 Claims**

1. A particulate beverage base composition comprising particles having a core of an individual crystallized sugar grain having a mean diameter of from 250 μm to 500 μm and a coating of cocoa powder, the composition having a poured apparent voluminal mass (d1) of 630 g/1 to 750 g/1, a free apparent voluminal mass (d2) of 750 g/1 to 860 g/1 and a degree of compressibility (d2-d1)/d2 below 20%.

5,487,905

PROCESS FOR THE PRODUCTION OF CANNELLONI

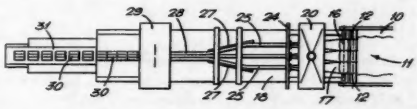
Lars Askman, Billesholm; Werner Leonhardt, Astorp, and Ingemar Svahn, Odakra, all of, Sweden, assignors to Nestec S.A., Vevey, Switzerland

Filed Jul. 5, 1994, Ser. No. 270,938

Claims priority, application European Pat. Off., Jul. 13, 1993, 93111161

Int. Cl.[6] A21C *9/06*

U.S. Cl. 426—297 **11 Claims**



1. A process for the continuous production of cannelloni comprising the steps of:

forming and blanching a longitudinally extending pasta strand to obtain a blanched strand;

cutting the blanched strand along its longitudinal extent into a plurality of strips to obtain longitudinally extending strips positioned side-by-side; and

with respect to each strip:

passing the strip in a direction of its longitudinal extent to and by a roller having a configuration of a curved surface and contacting the strip with the roller surface to curve the strip so that the curved strip has an upper curved surface which is concave in shape and a lower curved surface which is convex in shape, transporting the curved strip on a conveyor belt so that the convex surface is carried by the belt and depositing a filling onto the concave surface and forming the curved strip into a tube for enclosing the filling within the tube and so that the strip overlaps, and then, cutting the tube into tubular pieces.

5,487,906

METHOD OF FORMING STABLE AQUEOUS SOLUTIONS OF STANNOUS COMPOUNDS

Nagaraj Dixit, Plainsboro; Gary Durga, Edison; Michael R. Burke, Somerset; Michael Prencipe, West Windsor, and Suryakant Patel, Bridgewater, all of N.J., assignors to Colgate-Palmolive Company, Piscataway, N.J.

Filed Dec. 15, 1994, Ser. No. 356,804

Int. Cl.[6] A61K *33/16;7/18*

U.S. Cl. 424—673 **11 Claims**

1. A method for the preparation of an aqueous oral care composition containing a stable stannous ion releasing compound which comprises first dissolving the stannous compound in an aqueous

solution of citric acid or its alkali metal salt to prepare a premix and then adding the premix to the vehicle of the oral care composition.

5,487,907

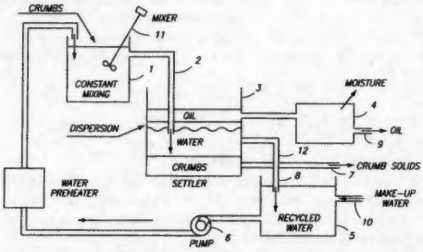
PROCESS TO RECOVER OIL FROM CRUMBS, FOOD PARTICLES AND CARBOHYDRATE MATRICES

David C. Drown, 818 Vista St., Moscow, Id. 83843-9629, and Karen Montez, 1010 Deakin #6, Moscow, Id. 83843

Filed Oct. 14, 1994, Ser. No. 324,170

Int. Cl.[6] C11B *13/00*

U.S. Cl. 426—417 **15 Claims**



1. A process for the separation of cooking oil from oil laden food crumbs, comprising the steps of:

a. providing food crumbs which contain cooking oil;

b. providing water to the food crumbs, the water being above a minimum temperature sufficient to effect separation of the food crumbs and oil, resulting in a combination of food crumbs, oil and water;

c. agitating the combination of food crumbs, oil and water;

d. placing the combination of food crumbs, oil and water into a non-turbulent settling container where the combination of food crumbs, water and oil is allowed to stratify; and

e. removing stratified oil from the upper portion of the settling container.

5,487,908

METHOD AND DEVICE FOR TRANSMITTING HEATING OR COOLING MEDIUM TO A FOOD PRODUCT ON A MOVING SUBSTRATE

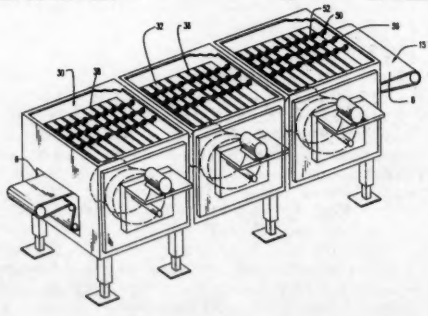
Jack Appolonia, Yardley, Pa.; Robert Muscato, Monmouth Junction, and George Wittel, Bridgewater Township, both of N.J., assignors to The BOC Group, Inc., New Providence, N.J.

Continuation of Ser. No. 23,299, Feb. 26, 1993, Pat. No. 5,334,406. This application Jul. 28, 1994, Ser. No. 281,938

The portion of the term of this patent subsequent to Aug. 2, 2011, has been disclaimed.

Int. Cl.[6] A23L *1/00;* **A21B** *1/00;* **F25D** *17/00*

U.S. Cl. 426—520 **27 Claims**



26. A method of heating or cooling a food product comprising:

passing a multidirectional flow of the heating or cooling medium into at least one continuous channel traversing at least a major portion of the width of a moving substrate having thereon said food product said channel being in the shape of a parallelpiped and having spaced-apart parallel walls, and discharging the heating or cooling medium in a unidirectional flow through a second opening toward the food product on said moving substrate.

5,487,909

PROCESS FOR PREPARING A MEAT EMULSION CONTAINING MEAT BROTH

Dale D. Zabel, Basking Ridge; Charles B. Brown, Rutherford, both of N.J., and James V. Cassetta, Pearl River, N.Y., assignors to Thomas J. Lipton Co., Division of Conopco, Inc., Englewood Cliffs, N.J.

Filed Oct. 18, 1994, Ser. No. 324,551

Int. Cl.[6] A23L *1/317*

U.S. Cl. 426—574 **9 Claims**

1. A method of preventing excessive cooking yield loss and enhancing the flavor of a ground or chopped meat product by lowering the concentration of auxiliary ingredients necessary to obtain a perceived flavor change in said product after cooking comprising:

(a) comminuting lean meat to prepare a lean meat mixture and controlling said comminuting to form a continuous heat-settable lean meat phase;

(b) adjusting the temperature of said lean meat phase to 30° F. to 40° F.;

(c) preparing a water-in-oil emulsion having a continuous phase containing edible fat and a discontinuous aqueous phase containing a gellable meat broth;

(d) hardening said Water-in-oil emulsion by reducing the temperature thereof to 20° F. to 30° F.; and

(e) mixing the lean meat phase of (b) and the hardened emulsion of (d) at a temperature of 10° F. to 30° F. to produce said ground or chopped meat product.

5,487,910

PROCESS FOR PREPARING A MEAT EMULSION CONTAINING MEAT BROTH AND PRODUCT THEREOF

Dale D. Zabel, Basking Ridge; Charles B. Brown, Rutherford, both of N.J., and James V. Cassetta, Pearl River, N.Y., assignors to Thomas J. Lipton, Co., Division of Conopco, Inc., Englewood Cliffs, N.J.

Filed Nov. 29, 1994, Ser. No. 346,103

Int. Cl.[6] A23L *1/317*

U.S. Cl. 426—574 **13 Claims**

1. A method of preventing excessive cooking yield loss and enhancing the flavor of a ground or chopped meat product by lowering the concentration of auxiliary ingredients necessary to obtain a perceived flavor change in said products after cooking comprising:

(a) comminuting lean meat to prepare a lean meat mixture and controlling said comminuting to form a continuous heat-settable lean meat phase;

(b) adjusting the temperature of said lean meat phase to 30° F. to 40° F.;

(c) preparing a water-in-oil emulsion having a continuous phase containing edible fat and a discontinuous aqueous phase containing a gellable meat broth;

(d) hardening said water-in-oil emulsion by reducing the temperature thereof to 20° F. to 30° F.;

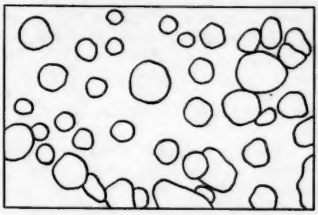
(e) mixing the lean meat phase of (b) and the hardened emulsion of (d) at a temperature of 10° F. to 30° F. to produce said ground or chopped meat product; and then

(f) heating said product at a temperature sufficiently high and for a sufficient length of time to achieve an internal temperature of 155° F.–165° F., thereby heat setting said product.

5,487,911
PROCESSED EGG POWDER AND PROCESS FOR PRODUCTION THEREOF

Tsunesuke Ueda, Hino; Tadao Kusama, Fuchu, and Kazuo Honma, Tama, all of, Japan, assignors to Kewpie Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 879,681, May 4, 1992, abandoned, which is a continuation of Ser. No. 606,137, Oct. 31, 1990, abandoned. This application Jul. 22, 1994, Ser. No. 279,085
Claims priority, application Japan, Jan. 31, 1989, 1-283445; Jul. 17, 1990, 2-188353
Int. Cl.[6] A23L *1/32*
U.S. Cl. 426—614 6 Claims

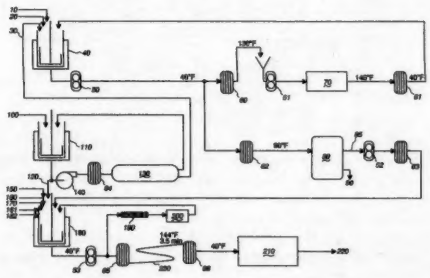


1. A processed egg yolk powder consisting essentially of water-insoluble dry egg yolk particles of substantially spherical shape, wherein the insolubility in water of said processed egg yolk powder corresponds to an NSI Index of about 30 or less.

5,487,912
METHOD OF PRODUCING CHOLESTEROL-REDUCED WHOLE EGG PRODUCTS

Ronald L. Meibach, Deerfield; Pamela S. Hockenberry, Evanston, and Bilal Kaafarani, Hoffman Estates, all of Ill., assignors to Kraft Foods, Inc., Northfield, Ill.

Continuation of Ser. No. 212,276, Mar. 19, 1994, abandoned, which is a continuation-in-part of Ser. No. 102,114, Aug. 4, 1993, abandoned, which is a continuation of Ser. No. 829,398, Feb. 3, 1992, abandoned. This application May 1, 1995, Ser. No. 431,624
Int. Cl.[6] A23L *1/32*
U.S. Cl. 426—614 34 Claims



1. A method of extracting cholesterol from egg yolk, where the method comprises the steps of: combining egg white permeate produced by ultrafiltration, egg yolk and oil to form a mixture containing a ratio of oil to yolk to permeate between about 4:1:0.8 to about 1.5:1.0:0.2; shearing the mixture and recovering a cholesterol-reduced egg yolk and permeate blend by subjecting the sheared mixture to centrifugation so as to separate the oil from the egg yolk.

5,487,913
BUTTER PRODUCTS

Robert N. Fackrell, and Lorenzo P. Griffeth, both of Preston, Id., assignors to Creamery Hollow U.S.A., Inc., Preston, Id.

Filed Mar. 31, 1994, Ser. No. 221,068
Int. Cl.[6] A23C *15/16;15/06;15/18;* A23D *7/015*
U.S. Cl. 426—663 49 Claims

1. A method of making a butter product which comprises the steps of: providing a feedstock comprising sweet cream or whey cream and having a fat content of at least 25 percent and sequentially pasteurizing said feedstock and homogenizing the pasteurized feedstock; the providing, pasteurization, and homogenizing of the feedstock being so carried out as to effect a phase reversal and the formation of an emulsion of feedstock liquid in feedstock fat.

5,487,914
METHOD OF ADDING UV LIGHT ABSORBERS INTO POLYMERIC SUBSTRATES

John L. Gerlock, Dearborn, and Mark P. Everson, Canton, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 3, 1994, Ser. No. 316,744
Int. Cl.[6] B05D *3/62;3/10;* B32B *35/00*
U.S. Cl. 427—140 6 Claims

1. A method for providing ultraviolet light absorbers into a cured automotive paint, which method comprises the steps of:

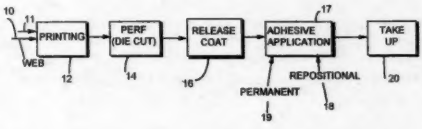
providing a coating, on said paint, of a composition comprising ultraviolet light absorber suspended in a non-reactive carrier;

heating said coating to an elevated temperature above about 60° C. for a time sufficient to cause said ultraviolet light absorber to diffuse into said paint.

5,487,915
PERFORATING BLADE/LABEL PERFORATING

Timothy J. Russ, Niagara Falls; Khal M. Khatib, Youngstown, and Jay O. Baker, Grand Island, all of N.Y., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Division of Ser. No. 321,025, Oct. 6, 1994. This application Jun. 5, 1995, Ser. No. 463,557
Int. Cl.[6] B05D *5/10*
U.S. Cl. 427—208 19 Claims



1. A perforating blade for perforating labels, comprising:

a steel body; and

upstanding from said body, a plurality of linearly spaced steel teeth, each tooth having a thickness of about 0.025–0.030 inches, and 30–58 teeth provided per inch, said teeth positioned on said blade so that they provide a cut to tie ratio of 0.018×0.008 to 0.012×0.008;

said body and teeth capable of withstanding thousands of repeated applications of about 500–600 psi without failure during perforation of a label web.

5,487,916
METHOD FOR COATING PARTICLES IN A SPRAY-DRYING PLANT

Børge H. Christensen, Odinshøjvej 116, 3140 Ålsgarde, Denmark

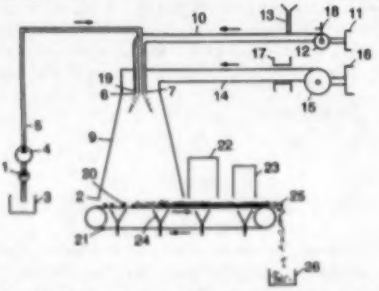
PCT No. PCT/DK92/00384, § 371 Date Jul. 14, 1994, § 102(e) Date Jul. 14, 1994, PCT Pub. No. WO93/11844, PCT Pub. Date Jun. 24, 1993

PCT Filed Dec. 17, 1992, Ser. No. 244,547

Claims priority, application Denmark, Dec. 17, 1991, 2017/91

Int. Cl.[6] B05D *7/00*

U.S. Cl. 427—213 **18 Claims**



1. A method for producing a free-flowing powder comprising particles of a carrier material coated with a coating composition using a spray-drying plant comprising a spray-drying chamber and an atomizing means selected from a high-pressure atomizing nozzle and an atomizing wheel arranged in the spray-drying chamber, the method comprising

supplying the coating composition in liquid form to the atomizing means of the plant and atomizing the liquid coating composition into a flow of droplets,

supplying a flow of transport gas comprising particles of the carrier material dispersed therein to the spray-drying chamber separately from the coating composition,

supplying a flow of drying gas to the chamber, the drying gas being of a temperature selected to solidify the liquid coating composition,

allowing droplets in the flow of liquid droplets of the coating composition to collide with the particles of the carrier material dispersed in the transport gas, the direction and flow rate of the transport gas being adapted to substantially prevent contact between the drying gas and the droplets, so that the liquid coating composition, before any substantial drying thereof, will form a substantially continuous liquid coating layer on the particles, the flow of the transport gas with the particles of the carrier material dispersed therein and the flow of the drying gas being directed substantially parallel to each other and being regulated so that they form a substantially distinct interface of a substantially constant shape in a region upstream of and adjacent to the region where the collision between the liquid droplets and the particles takes place,

then allowing the thus applied continuous coating layer on the particles to at least partially dry by contact with the drying gas, and

withdrawing the coated particles from the spray-drying chamber.

5,487,917
CARBON COATED SUBSTRATES

Kishor P. Gadkaree, Big Flats, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Mar. 16, 1995, Ser. No. 407,522

Int. Cl.[6] B05D *3/02*

U.S. Cl. 427—228 **8 Claims**

1. A method of producing activated carbon supported on a substrate, the method comprising:

a) impregnating a porous substrate with a crosslinking resin curing catalyst;

b) impregnating the catalyst impregnated substrate from step a with a crosslinking thermosetting resin;

c) curing the resin;

d) carbonizing the resin; and

e) activating the carbon by heating the carbon impregnated substrate from step d under oxidizing conditions to remove amorphous carbon and produce molecular size porosity in the carbon thereby producing an activated carbon impregnated substrate.

5,487,918
METHOD OF DEPOSITING METAL OXIDES

Masud Akhtar, 8 Wexford Dr., Lawrenceville, N.J. 08648

Continuation-in-part of Ser. No. 523,326, May 14, 1990, Pat. No. 5,089,248. This application Feb. 18, 1992, Ser. No. 837,216

Int. Cl.[6] C23C *16/40*; **B05D** *3/02*

U.S. Cl. 427—255.3 **18 Claims**

1. A method of depositing metallic oxides on a substrate, consisting essentially of:

(a) providing a metallic compound in an inert atmosphere, said metallic compound containing a metal selected from the group consisting of Group 1A to Group VIII metals;

(b) reacting said metallic compound with an organosemiconductor oxane to deposit a metallic oxide.

5,487,919
METHOD OF MANUFACTURING OF GALVANIZED STEEL SHEET HAVING HIGH PRESS FORMABILITY

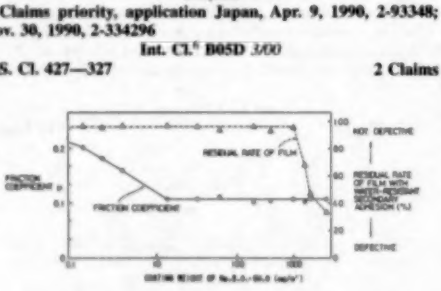
Yoichi Tobiyama; Chiaki Kato; Nobuyuki Morito, and Hajime Kimura, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Continuation-in-part of Ser. No. 71,938, Jun. 3, 1993, abandoned, which is a continuation of Ser. No. 756,528, Sep. 9, 1991, abandoned, which is a division of Ser. No. 636,233, Dec. 31, 1990, abandoned. This application Dec. 29, 1993, Ser. No. 175,682

Claims priority, application Japan, Apr. 9, 1990, 2-93348; Nov. 30, 1990, 2-334296

Int. Cl.[6] B05D *3/00*

U.S. Cl. 427—327 **2 Claims**



1. A method of manufacturing a galvanized steel sheet with high press formability, comprising the steps of:

(a) effecting a galvanization on a steel sheet followed by an alloying treatment;

(b) immersing said galvanized steel sheet in a bath of an aqueous solution containing 0.5 to 2.0 wt % of hydrous borate of an alkali metal;

(c) taking said steel sheet out of said bath and effecting such a control as to make a water-containing borate film on a surface of the steel sheet in a range from 10 to 1,000 mg/m^2;

(d) heating said steel sheet at a temperature ranging from 60° to 100° C. to dry said film and effecting such a control as to make the total water content, including water contained in the water-containing borate film and crystalline water contained in the water-containing borate film, in a range from 20 to 70%.

5,487,920

PROCESS FOR PLASMA-ENHANCED CHEMICAL VAPOR DEPOSITION OF ANTI-FOG AND ANTI-SCRATCH COATINGS ONTO VARIOUS SUBSTRATES

Eugene S. Lopata, and John S. Nakanishi, both of Alameda County, Calif., assignors to The BOC Group, Inc., New Providence, N.J.

Filed Apr. 19, 1994, Ser. No. 230,028

Int. Cl.[6] B05D *3/06*

U.S. Cl. 427—489 **13 Claims**

1. A method for preparing an anti-fog coating, an anti-scratch coating or a combined anti-fog, anti-scratch coating on a surface of a substrate in one or more plasma reaction zones of an evacuated chamber, comprising:

(a) optionally bombarding the surface with plasma species sufficient to clean the surface or to promote adhesion of a coating to be placed thereon;

(b) coating the surface with polymerized silicon by plasma polymerization, the polymerized silicon coating derived from a coating gas stream including a silicon monomer and oxygen, the plasma polymerization being conducted with a power density over a length of time; and,

(c) modifying the coated surface with a plasma composition derived from a surface modifying gas stream, the surface modifying gas stream consisting essentially of from about 80 to 40 mole % N_2O and from about 20 to 60 mole % CO_2.

5,487,921

Patent Not Issued For This Number

5,487,922

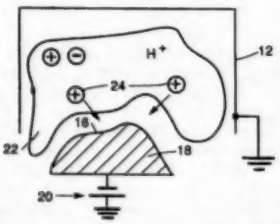
SURFACE PREPARATION AND DEPOSITION METHOD FOR TITANIUM NITRIDE ONTO CARBON-CONTAINING MATERIALS

Simon K. Nieh, Monrovia; Jesse N. Matossian, Canoga Park; Frans G. Krajenbrink, Newbury Park, and Robert W. Schumacher, Woodland Hills, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 929,970, Aug. 14, 1992, abandoned. This application Jun. 14, 1994, Ser. No. 259,371

Int. Cl.[6] B05D *3/06;* **C23C** *14/00;* **C23F** *1/00*

U.S. Cl. 427—528 **24 Claims**



1. A process for depositing a coating of titanium nitride onto a modified surface of a metallic substrate containing greater than 1 wt. % carbon, said carbon comprising graphite, comprising the steps of:

(a) cleaning said surface to remove contaminates from said surface and modifying said surface by exhausting any said graphite from said surface by exposure thereof to a first plasma comprised of ions;

(b) heating said surface with first ions or first electrons from said first plasma to a chosen temperature within the range of about 300° to 600° C.; and

(c) depositing said coating of said titanium nitride onto said modified surface of said substrate in a second plasma which provides second ions while maintaining the temperature of said substrate at said chosen temperature.

5,487,923

METHOD FOR DEPOSITING TUNGSTEN NITRIDE THIN FILMS FOR FORMATION OF METAL WIRINGS OF SILICON SEMICONDUCTOR ELEMENTS

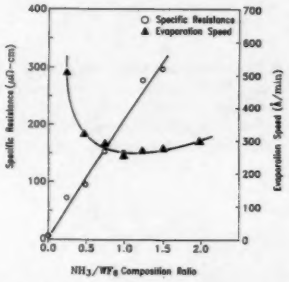
Suk-ki Min, and Yong T. Kim, both of Seoul, Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea

Continuation of Ser. No. 912,378, Jul. 13, 1992, abandoned. This application Nov. 23, 1993, Ser. No. 155,915

Claims priority, application Rep. of Korea, Jul. 16, 1991, 12125/1991

Int. Cl.[6] C23C *16/00*

U.S. Cl. 427—569 **2 Claims**



1. A method of forming a metallic wiring for a silicon semiconductor device which comprises:

providing a silicon semiconductor substrate;

depositing a layer of tungsten nitride on said silicon semiconductor substrate by a radio frequency plasma enhanced chemical vapor deposition process which utilizes a WF_6-NH_3-H_2 reactant gas mixture and a 13.56 MHz glow discharge; and

depositing a layer of tungsten on said layer of tungsten nitride by a plasma enhanced chemical vapor deposition process which utilizes a WF_6-H_2 reactant gas mixture and a 13.56 MHz glow discharge and produces fluorine atoms from the WF_6,

wherein said tungsten nitride layer prevents corrosion of said silicon semiconductor substrate by said fluorine atoms during the deposition of said tungsten layer.

5,487,924

NAPKIN RING

Dorothy C. Fritze, 6064 Meadowbrook Dr., Morrison, Colo. 80465

Continuation-in-part of Ser. No. 10,719, Jul. 15, 1993, Pat. No. D. 353,522. This application Nov. 5, 1993, Ser. No. 147,754

Int. Cl.[6] A47G *11/00;* **D04D** *7/10*

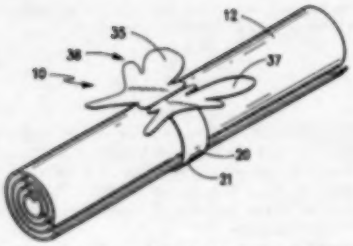
U.S. Cl. 428—5 **21 Claims**

1. A napkin ring adapted to receive a napkin, comprising:

(a) an elongated strip formed of a flexible material, said strip having opposite ends, a pair of lateral side edges extending longitudinally between said ends to define a strip width therebetween, a front surface and a back surface;

(b) a head portion disposed at each opposite end of said strip; and

(c) a pair of cooperating, spaced-apart slots, each of said slots located proximate to a respective one of said head portions, said slots sized and adapted for matable engagement with one another when said strip is configured into a closed loop, said loop to encompass a napkin with said pair of head portions



located adjacent to one another in a fastened state, each of said pair of head portions configured to have a perimeter of a selected shape such that said perimeters when said head portions are in the fastened state form a continuous outline of an object.

5,487,925

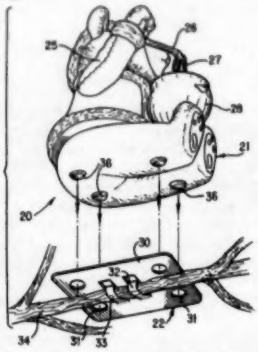
ORNAMENT/DISPLAY MEMBER

Thomas L. Simmel, Milford; Robert S. McDarren, Ridgefield, both of Conn., and Joseph Truchsess, City Island, N.Y., assignors to Link Group International, Ridgefield, Conn.

Filed Feb. 6, 1995, Ser. No. 384,409

Int. Cl.[6] B32B *3/00*

U.S. Cl. 428—19 **25 Claims**



1. A decorative, exciting ornament/display system constructed for being positioned and securely retained on a conventional support surface and on a branch of a tree, said ornament/display system comprising

A. an attention attracting member

a. constructed to produce at least one function selected from the group consisting of automated visually stimulating movements and presentation of audible and reproducible sounds or messages, and

b. designed for enhancing the appearance and festive decorative effect provided by the member and the area with which the member is associated; and

B. a support plate securely mountable to a limb of a tree and comprising

a. engagement clip means constructed for being removably securely interengaged with a portion of a tree limb for securely affixing the plate to the limb when desired, and

b. securement means formed on the plate for cooperative locking interengagement with the interest generating member for securing the member to the plate when desired;

whereby a decorative, exciting ornament/display system is realized which enables an attention attracting member to be quickly and easily mounted to a supporting plate affixed to a tree limb for displaying the member as a part of the tree, as well as enabling the member to be removed from the plate, whenever desired, for displaying the member in any other desired location.

5,487,926

OPTICAL DISK

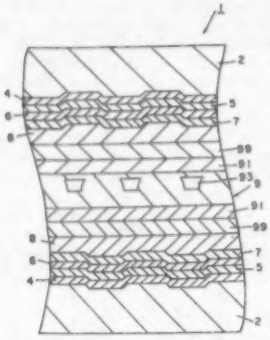
Isamu Kuribayashi, Saku, and Shin-ichi Tezuka, Nagano, both of, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Nov. 20, 1991, Ser. No. 794,977

Claims priority, application Japan, Nov. 22, 1990, 2-320104; Nov. 22, 1990, 2-320105

Int. Cl.[5] F16B *2/00;* **B32B** *3/02;* **G11B** *5/66*

U.S. Cl. 428—33 **26 Claims**



1. An optical disk comprising:

a pair of disk substrates each having inside and outside surfaces and inner and outer circumferential edges and adapted to be mated such that their inside surfaces face each other;

information carrying means comprising a magneto-optical recording material on at least one disk substrate inside surface;

a pair of self-adhesive layers adjacent each of the respective substrate inside surfaces, a multiplicity of linear channels being formed entirely in at least one self-adhesive layer of said pair of self-adhesive layers and extending from the inner circumferential edge to the outer circumferential edge of said disk substrate joining said at least one self-adhesive layer; and

wherein said self-adhesive layers are bonded together to integrate the pair of disk substrates.

5,487,927

DECORATING METHOD AND PRODUCTS

Melvin E. Kamen, Highlands, and Bhupendra Patel, Edison, both of N.J., assignors to Revlon Consumer Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 824,968, Jan. 24, 1992, abandoned. This application Feb. 22, 1994, Ser. No. 199,415

Int. Cl.[6] B32B *9/00;31/00*

U.S. Cl. 128—34.4 **24 Claims**

1. A method for decorating a substrate with hot stamping foil comprising the steps of:

a) applying an ink composition comprised of a cationically radiation curable cycloaliphatic epoxide to the substrate in a predetermined design, said ink being operable when cured to bond to the substrate,

b) curing the ink on the substrate by exposing it to the radiation by which it is curable, thereby bonding the ink composition to the substrate,

c) pressing a sheet of hot stamping foil against the substrate with a die heated to a temperature sufficient to cause a portion of the hot stamping foil to adhere to the heated, cured ink design but not to the ink-free areas of the substrate, and

d) removing the die, thereby leaving behind a portion of the foil adhered to the ink design.

5,487,928

FIBER REINFORCED COMPOSITE MATERIAL AND A PROCESS FOR THE PRODUCTION THEREOF

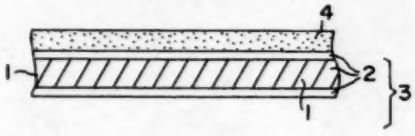
Jun Fujimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 454,266, Dec. 21, 1989, abandoned. This application Jun. 29, 1992, Ser. No. 905,222

Claims priority, application Japan, Dec. 22, 1988, 63-325217; Dec. 22, 1988, 63-325218

Int. Cl.[6] B37B *15/08;27/38;27/06*

U.S. Cl. 428—36.4 5 Claims



1. A prepreg sheet comprising (i) a layer of a composite material for damping vibration prepared by impregnating unidirectionally aligned reinforcing fibers in a matrix resin and semi-hardening the base resin and (ii) a coating thereon of a viscoelastic damping material in a semi-hardened or hardened condition, said viscoelastic damping material having a low Young's modulus with high vibration damping, at room temperature.

5,487,929

REPOSITIONABLE WALL COVERING

George Rusincovitch, Jr., Worthington, and Paul J. Roe, Columbus, both of Ohio, assignors to Borden, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 12,822, Feb. 3, 1993, abandoned. This application Jul. 29, 1994, Ser. No. 282,792

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—40 25 Claims

1. A self-adhesive decorative sheet that is easily repositioned after initial contact with a wall, comprising:

A. a sheet having a decorative front side and a back side;

B. a tacky pressure sensitive adhesive layer applied onto said back side, said layer having gaps lacking adhesive on said back side; and

C. projections which are not sticky or tacky rising from said back side within said gaps and having a height at least equal to the thickness of the adhesive, said projections being separated from the adhesive by a portion of said gaps.

5,487,930

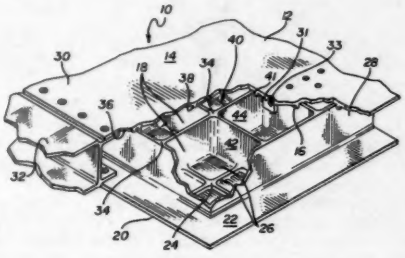
THREE STRUCTURE STRUCTURAL ELEMENT WITH INTERLOCKING RIBBING

James J. Lockshaw, Huntington Beach; Stephen Kelly, Yorba Linda; Randall Walker, Santa Ana, and John Kaiser, Jr., Huntington Beach, all of Calif., assignors to Tolo, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 771,009, Oct. 3, 1991, Pat. No. 5,273,806. This application Dec. 27, 1993, Ser. No. 173,611

Int. Cl.[6] B32B *3/00*

U.S. Cl. 428—53 33 Claims



1. Structural element comprising opposed first and second laterally and longitudinally extended surface structures each having a closed figure pattern of ribbing projecting therefrom toward the opposite surface structure, a third structure disposed between said first and second surface structures in ribbing-engaging relation therewith, said opposed ribbing being interlocked across said third structure in registered mating relation.

5,487,931

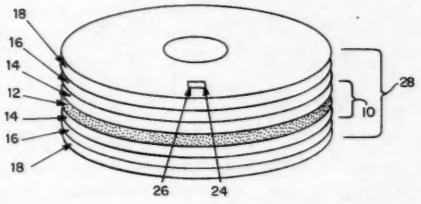
RIGID DISC SUBSTRATE COMPRISING A CENTRAL HARD CORE SUBSTRATE WITH A HARD, THERMALLY AND MECHANICALLY MATCHED OVERLYING SMOOTHING LAYER AND METHOD FOR MAKING THE SAME

William R. Annacone, 52 Rockview Rd., Southport, Conn. 06490; Kenneth P. Felis, 150 Gay Bowers Rd., Fairfield, Conn. 06430, and Dennis E. Speliotis, 22 Ingleside Rd., Lexington, Mass. 02173

Filed Dec. 2, 1993, Ser. No. 161,233

Int. Cl.[6] B32B *3/02*

U.S. Cl. 428—64.1 23 Claims



1. A rigid disc substrate capable of supporting a magnetic medium thereon, which comprises a central hard core substrate having a hardness of at least about 1230 Knoop, the hard core substrate consisting of a silicon carbide material having no unbound silicon and having an overlying smoothing layer thereon.

5,487,932

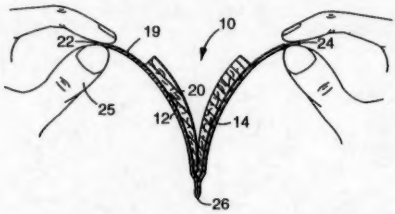
APPLICATOR WIPE FOR VISCOUS FLUIDS

Wayne K. Dunshee, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 898,770, Jun. 12, 1992, abandoned. This application Feb. 1, 1994, Ser. No. 191,050

Int. Cl.[6] **A61B** *17/20;* **B65D** *75/00*

U.S. Cl. 428—68 **13 Claims**



1. A combined fluid storage container and applicator device for viscous fluids, said device comprising a fluid impermeable sheet material having opposed portions positioned in generally flat parallel overlying relation to each other, temporary fluid impermeable seal means sealing said opposed portions to each other along a temporary seal line forming a cavity and enclosing a viscous liquid having a viscosity no less than 250 centipoise between said opposed portions, a low density fluid retaining pad having a density of no more than 0.05 g/cm^3 and a compression resistance of no more than 450 g/cm^2 adhered to each of said opposed portions of said material and disposed in said cavity such that said viscous liquid is generally contained within said pad, and means for opening said temporary seal means along at least a part of the length of said seal line to expose the viscous liquid containing pad that may assume a generally flat configuration while said pad is adhered to each of said opposed portions of said material.

5,487,933

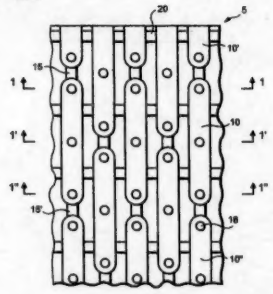
PROSTHETIC ARTICLES AND METHODS FOR PRODUCING SAME

Eugene W. White, Rossiter, Pa., assignor to Interpore International, Irvine, Calif.

Continuation-in-part of Ser. No. 134,260, Oct. 8, 1993, which is a division of Ser. No. 647,999, Jan. 30, 1991, Pat. No. 5,348,788. This application Sep. 19, 1994, Ser. No. 308,762

Int. Cl.[6] **B32B** *3/24;* **A61F** *2/28*

U.S. Cl. 428—131 **17 Claims**



1. A non-woven porous mesh in sheet form, said mesh comprising:

a continuous sheet having a substantially uniform thickness between opposing sides;

a series of substantially parallel and linked main troughs extending in one horizontal direction along a first side of said sheet, said main troughs having a depth in said sheet that extends substantially into said sheet, said main troughs are spaced from adjacent main troughs by a distance approximately ½ a width of said main trough, said main troughs further linked to co-linear troughs by a first series of secondary shallow troughs;

one or more small openings extending through the bottom of each main trough to a second side of said sheet, said openings having a diameter that is approximately ⅓ the width of said main trough; and

a second series of secondary shallow troughs extending substantially perpendicular to and connecting said main troughs.

5,487,934

Patent Not Issued For This Number

5,487,935

Patent Not Issued For This Number

5,487,936

TEXTILE FABRICS OF DIFFERENTIAL WEAVE COMPRISING MULTIFILAMENT THREADS WHEREIN INDIVIDUAL FILAMENTS HAVE A LINEAR DENSITY OF ONE DECITEX OR LESS

Susan J. Collier, London, United Kingdom, assignor to Collier Campbell Ltd., Northside, England

Filed Mar. 24, 1994, Ser. No. 217,148

Claims priority, application United Kingdom, Mar. 21, 1994, 940554604

Int. Cl.[6] **D06P** *3/82;* **B32B** *7/00;* **D03D** *15/00*

U.S. Cl. 428—229 **18 Claims**

1. A woven fabric comprising warp threads and weft threads, the fabric exhibiting an iridescent play of color to the eye, wherein the weft threads consist solely of a multifilament microfibre yarn of individual filaments, each filament having a linear density of 1 decitex or less and the warp threads comprise one of cotton or other natural fibres having a bulk similar to the bulk of the microfibre yarn, the warp threads and the weft threads colored together after manufacturing the fabric with dyestuffs specifically directed to the innate structure of the warp threads and the weft threads, thereby producing a harmonious fabric of iridescent color wherein the weft threads have selectively a different color than the warp threads.

5,487,937

METAL-POLYMER COMPOSITE INSULATIVE SPACER FOR GLASS MEMBERS AND INSULATIVE WINDOW CONTAINING SAME

Charles D. Newby, Bexley, Ohio, assignor to Crane Plastics Company Limited Partnership, Columbus, Ohio

Continuation-in-part of Ser. No. 870,018, May 18, 1992, abandoned. This application Jan. 19, 1993, Ser. No. 5,730

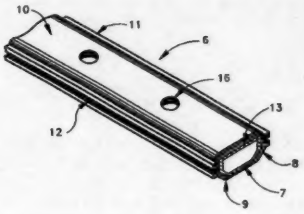
Int. Cl.[6] **B32B** *7/12;* **E06B** *3/24*

U.S. Cl. 428—317.1 **30 Claims**

1. A spacer member for use between two glass members, said spacer member comprising a metal-polymer composite, said composite comprising:

(a) a metal substrate; and

(b) a foamed thermoplastic polymer disposed on said metal substrate and adhered to said metal substrate with a heat activated adhesive so as to form said metal-polymer composite.



5,487,938

SILICA SUPPORTED TRANSITION METAL CATALYST

Lee Spencer, Pearland; Brian W. S. Kolthammer, Lake Jackson; Miriam P. Ripplinger, Lake Jackson; Jeffrey J. Wooster, Lake Jackson; Pak-Wing S. Chum, Lake Jackson, and Jacquelyn A. deGroot, Freeport, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 21,705, Feb. 24, 1993, Pat. No. 5,420,092, which is a division of Ser. No. 854,175, Mar. 20, 1992, Pat. No. 5,231,151, which is a continuation-in-part of Ser. No. 644,053, Jan. 18, 1991, abandoned. This application Nov. 10, 1994, Ser. No. 336,947

Int. Cl.[6] B32B *7/12*

U.S. Cl. 428—332 **11 Claims**

1. In a process for extruding an ethylene/alpha-olefin copolymer into a film, the improvement comprising employing as said ethylene/alpha-olefin copolymer one having greater than about 17 percent high density fraction and a M_w/M_n ratio of less than about 3.6 to form a film having a gauge from about 0.4 to about 1.2 mils, a percent ultimate stretchability of at least about 280, and a puncture resistance of at least about 250 ft-lbs/cm^3.

5,487,939

PROCESS FOR PREPARATION OF COLORED THERMOPLASTIC COMPOSITE SHEETING FOR LAMINATED STRUCTURES

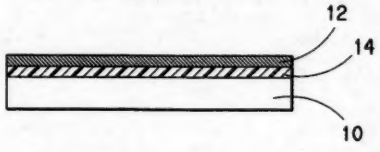
Thomas R. Phillips, Vienna, W. Va., and Siva V. Vallabhaneni, Voorhees, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

PCT No. PCT/US91/01586, § 371 Date Sep. 13, 1993, § 102(e) Date Sep. 13, 1993, PCT Pub. No. WO93/16369, PCT Pub. Date Jan. 10, 1992

PCT Filed Mar. 14, 1991, Ser. No. 117,111

Int. Cl.[6] B32B *3/00*

U.S. Cl. 428—334 **11 Claims**



1. A process for preparing colored thermoplastic sheeting for use in laminated structures wherein the thermoplastic sheeting has a roughened surface, the steps comprising

a) coating a layer having a uniform thickness of a non-pigmented binder resin onto a carrier film,

b) coating an ink containing finely divided solid crystalline pigment particles dispersed in a solvent-containing binder resin onto the coated carrier film, to provide a composite coating on said carrier film having a thickness from about 0.2 to 10 microns,

c) drying the said composite coating to remove the solvent and provide a solvent-free coating,

d) bringing the solvent-free composite coating of step c) into contact with the roughened surface of said thermoplastic sheeting,

e) separating said carrier film from said composite coating and transferring said composite coating to the surface of said thermoplastic sheeting by applying sufficient heat and pressure to release said composite coating from said carrier film while maintaining the roughened surface of said sheeting.

5,487,940

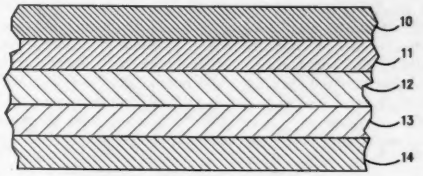
OXYGEN AND MOISTURE BARRIER METALLIZED FILM STRUCTURE

Eber C. Bianchini, Rochester, N.Y.; Anthony R. Knoerzer, Plano, Tex.; Larry A. Parr, Canandaigua, and Leland W. Reid, Palmyra, both of N.Y., assignors to Mobil Oil Corp., Fairfax, Va.

Continuation-in-part of Ser. No. 80,602, Jun. 24, 1993, Pat. No. 5,380,586, which is a continuation-in-part of Ser. No. 812,493, Dec. 23, 1991, abandoned. This application Aug. 31, 1994, Ser. No. 297,945

Int. Cl.[6] B32B *27/30;33/00*

U.S. Cl. 428—349 **17 Claims**



1. A polymeric film structure which comprises:

(I) a polymeric substrate having at least one treated surface for the receipt of an oxygen barrier coating;

(II) an oxygen barrier coating on said one treated surface of said polymeric substrate, said oxygen barrier coating comprising polyvinyl alcohol cross-linked with an cross-linking agent in the presence of sulfuric acid present in an amount sufficient to catalyze cross-linking of said polyvinyl alcohol, said coating having an outer surface opposite said polymeric substrate; and

(III) a moisture barrier on said outer surface of said oxygen barrier coating, said moisture barrier comprising an oriented polyolefin layer having at least one treated surface and a metal coating thereon whereby said polymeric film structure has enhanced oxygen and moisture barrier properties.

5,487,941

CONTINUOUS/DISCONTINUOUS FILAMENT YARN OR TOW

John N. Pepin, R.R. 1, Box 109N, Alfred, Me. 04002

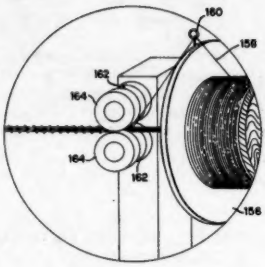
Continuation-in-part of Ser. No. 98,210, Jul. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 791,071, Nov. 12, 1991, abandoned. This application May 17, 1994, Ser. No. 243,775

Int. Cl.[6] D02G *3/00*

U.S. Cl. 428—364 **2 Claims**

1. A yarn or tow useful in forming molding preforms comprising a single layer of a multiplicity of discontinuous, unentangled filaments **10** in an amount of 40–60% by volume which is sandwiched between a first and second layer of continuous filament bands **14** and **16**;

a helical fiber wrap binds said discontinuous filaments **10** together with said first and second continuous filament bands **14** and **16**, wherein said helical fiber wrap and said continuous filament bands are formed of a material selected from the group consisting of polyethylene terephthalate, polyphenylene sulfide, polypropylene, polysulfones, polyether ether ketones, polyimides, polyamides, and aluminum.



5,487,942

CARBOXYL GROUP-MODIFIED ACRYLONITRILE FIBER AND PROCESS OF PRODUCING SAME

Reizo Gomibuchi, Uji, Japan, assignor to Nippon Sanmo Sensyoku Co., Ltd., Japan

Division of Ser. No. 234,125, Apr. 28, 1994, abandoned. This application Oct. 25, 1994, Ser. No. 329,081

Int. Cl.[6] D02G *3/00*

U.S. Cl. 428—364 **3 Claims**

1. A modified fiber comprising a fiber substrate, said fiber substrate formed of a homopolymer of acrylonitrile or a copolymer of acrylonitrile with a vinyl comonomer, and a graft comonomer graft-copolymerized to said substrate fiber in an amount of 3–60% by weight based on the weight of said substrate fiber, said graft comonomer being at least one member selected from the group consisting of methacrylic acid and hydroxyalkyl methacrylates.

5,487,943

MULTICONSTITUENT FIBERS, AND NONWOVEN STRUCTURES OF SUCH FIBERS

Randall E. Kozulla, Social Circle, Ga., assignor to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 47,407, Apr. 19, 1993, abandoned. This application Feb. 27, 1995, Ser. No. 395,484

Int. Cl.[6] D02G *3/00*

U.S. Cl. 428—373 **24 Claims**

1. A multiconstituent fiber, comprising a dominant continuous linear low density polyethylene phase and at least one discontinuous phase, dispersed through the dominant continuous phase in the form of domains, at least 70 percent by weight of the at least one discontinuous phase comprising domains having a diameter of about 0.05 to about 0.3 microns, the at least one discontinuous phase comprising at least one polymer selected from the group consisting of poly(propylene-co-ethylene) copolymers and polypropylene.

5,487,944

NON-WOVEN FABRIC SHEET SEPARATOR MATERIAL FOR STORAGE BATTERIES AND METHOD FOR MAKING THE SAME

Isao Ikkanzaka, Takarazuka; Kazuhiro Ikeda, Suita, and Yousuke Takai, Hyogo, all of, Japan, assignors to Kanai Juyo Kogyo Co., Ltd., Itami, and Daiwabo Create Co., Ltd., Osaka, both of, Japan

Division of Ser. No. 937,950, Sep. 1, 1992, Pat. No. 5,354,617. This application Oct. 11, 1994, Ser. No. 320,393

Claims priority, application Japan, Jan. 23, 1991, 3-275154

Int. Cl.[6] B05D *3/02*

U.S. Cl. 428—374 **4 Claims**

1. A method of manufacturing an alkaline storage battery separator comprising:

(A) forming a fiber web of conjugate fibers of a thermally bonding type and a polyolefin based fiber, said conjugate fibers comprising a first component having an ethylene based random copolymer of 0.5 to 25% by weight of acrylic acid and/or maleic acid, 0 to 24.5 % by weight of an acrylic acid ester and 99.5 to 75% by weight of ethylene, said copolymer having a melting point Tm_1° C., 70° C.<Tm_1<130° C., and a second component of a polyolefin based resin having a melting point Tm_2° C. of Tm_1+20° C.<Tm_2<250° C., and at least one of said first and second components has a sectional form divided into more than two parts with each component having at least one exposed surface and said first and second components have a weight ratio of 10:90 to 90:10 and an exposure ratio of 95:5 to 50:50;

(B) forming a non-woven fabric sheet by passing said fiber web through thermal press rollers to form a non-woven fabric sheet by melting said first component; and

(C) introducing sulfonic acid groups into tertiary carbon atom locations on the ethylene based random copolymer by contacting the non-woven fabric sheet with a sulfuric acid solution or a SO_3 gas.

5,487,945

DIAMOND FILMS ON NONDIAMOND SUBSTRATES

Peichun Yang; Wei Zhu, both of Raleigh, and Jeffrey T. Glass, Apex, all of N.C., assignors to North Carolina State University, Raleigh, N.C.

Division of Ser. No. 973,633, Nov. 9, 1992, Pat. No. 5,298,286. This application Nov. 5, 1993, Ser. No. 147,594

Int. Cl.[6] B24D *3/02*

U.S. Cl. 428—408 **18 Claims**

1. A structure comprising:

a nondiamond substrate having a face and comprising a transition metal capable of dissolving carbon; and

a plurality of oriented diamond seeds partially dissolved into the face of said substrate and being oriented so that individual diamond seeds are in alignment with a lattice of corresponding adjacent portions of said substrate.

5,487,946

THERMALLY-PROTECTIVE INTUMESCENT COATING

Vincent D. McGinniss, Sunbury; Richard J. Dick, Columbus; Robert E. Russell, III, Newark, all of Ohio, and Stephen D. Rogers, Bowie, Md., assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Aug. 2, 1994, Ser. No. 284,362
Int. Cl.[6] B27N 9/00; B32B 7/02
U.S. Cl. 428—413 18 Claims

1. A coating system for thermally protecting a substrate having a surface exposed to fire conditions comprising:

(a) a first coating layer coated on said surface of said substrate and cured thereon to form a first film layer which layer is thermally decomposable upon exposure to said fire conditions to form a first carbonific char which char intumesces to form a first rigid carbonific char foam; and

(b) a second coating layer coated on said first film layer and cured thereon to form a second film layer which layer is thermally decomposable upon exposure to said fire conditions to form a second carbonific char which char intumesces to form an insulative carbonific char foam having a density about half the density of said first rigid carbonific char foam, said first rigid carbonific char foam forming where said insulative carbonific char foam has broken through to expose said first film layer to said fire conditions; and wherein said coating system has a thickness of less than 50 mils.

5,487,947

WATER SOLUBLE COMPOSITE FILM

Osamu Kakishita; Jun Nishioka, both of Nagahama; Takeshi Fujita, Uji, and Katsuaki Matsuo, Kyoto, all of, Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, and Mitsubishi Plastics, Inc., Tokyo, both of, Japan

Filed Jul. 29, 1994, Ser. No. 282,538
Claims priority, application Japan, Aug. 3, 1993, 5-192439
Int. Cl.[6] B32B 27/30;27/36;27/40
U.S. Cl. 428—424.4 4 Claims

1. Water soluble composite film comprising a polyvinyl alcohol resin film laminated on a layer of a water soluble compound composed of a repetitive unit of the general formula (1):

$$—(A—X—A—R_2)— \quad (1)$$

wherein, A is a unit composed of a repetition of $—(CH_2CH_2O)—$ an

$$—(CH_2\underset{\displaystyle R_1}{\underset{|}{C}}HO)—,$$

provided that the unit $—(CH_2CH_2O)—$ exists at not less than 70% by weight in A, a repetitive number of $—(CH_2CH_2O)—$ is a positive number, and a repetitive number of

$$—(CH_2\underset{\displaystyle R_1}{\underset{|}{C}}HO)—$$

is zero or a positive number, R_1 is a hydrocarbon group, X is an organic residue of an organic compound having two active hydrogen groups and R_2 is a dicarboxylate compound residue or a diisocyanate compound residue, and wherein the weight average molecular weight of —A—X—A— is not less than 1,000.

5,487,948

BIS(BIS-SILYLALKYL) DICARBOXYLATES AS ADHESION PROMOTERS AND COMPOSITIONS CONTAINING THEM

Judith Stein, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 26, 1995, Ser. No. 378,692
Int. Cl.[6] B32B 9/04
U.S. Cl. 428—447 13 Claims

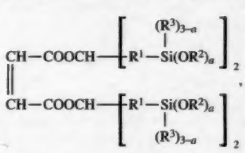
1. An addition curable composition comprising a mixture of:

(reagent A) at least one polyorganosiloxane having alkenyl groups bonded to silicon;

(reagent B) at least one hydride polyorganosiloxane comprising at least one organosiloxane unit having an Si—H moiety;

(reagent C) as a catalyst, at least one platinum group metal compound in an amount effective to cause hydrosilylation of reagent A with reagent B; and

(reagent D) an adhesion promoting proportion of a bis(bis-silylalkyl) dicarboxylate ester having the formula



(I)

wherein R^1 is C_{2-6} alkylene, each of R^2 and R^3 is independently C_{1-8} alkyl and a is from 1 to 3, said ester being the cis- or trans-isomer or a mixture thereof.

5,487,949

NON-CHROMATED OXIDE COATING FOR ALUMINUM SUBSTRATES

Matthias P. Schriever, 27636 128th Pl. SE., Kent, Wash. 98031

Division of Ser. No. 525,800, May 17, 1990, Pat. No. 5,298,092. This application Dec. 23, 1993, Ser. No. 173,591
Int. Cl.[6] B32B 15/04
U.S. Cl. 428—472.1 5 Claims

2. A coated article exhibiting corrosion resistance and paint adhesion properties, said article comprising:

(a) a substrate, said substrate being aluminum or aluminum alloy; and

(b) a cobalt conversion coating formed on said substrate, said cobalt conversion coating comprising aluminum oxide Al_2O_3 as the largest volume percent, and one or more cobalt oxides from the group consisting of CoO, Co_3O_4, and Co_2O_3.

5,487,950

MULTILAYER LACQUERING OF POLAR FILM SUBSTRATES BY A SINGLE APPLICATION OF MATERIAL

Gunter Weber, Fallingbostel; Ulrich Reiners, Neuenkirchen, and Sebastian Meyer-Stork, Bielefeld, all of, Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Germany

Filed Feb. 3, 1994, Ser. No. 191,568

Claims priority, application Germany, Feb. 10, 1993, 43 03 833.6

Int. Cl.[6] B32B *9/04*

U.S. Cl. 428—484 **12 Claims**

1. A coating system which upon a :single application to a polar film forms a multilayer structure on said film, comprising an aqueous carrier and

A) a wax melting between about 50° and 120° C. and present as particles of a diameter below 1 μm,

B) a copolymeric binder, constituting from about 10 to 60% by weight of the solids in said aqueous carrier and comprising monomeric units of at least two members selected from the group consisting of an acrylate, a methacrylate, vinyl acetate, vinyl alcohol, ethylene, propylene, styrene, acrylic acid, methacrylic acid, acrylamide and acrylonitrile,

C) the wax being present in from about 3 to 50% by weight of the copolymeric binder,

there being a difference of at least about 10 mN/m in surface tension between an otherwise identical system containing

i) said wax but not said copolymeric binder, and

ii) said copolymeric binder but not said wax,

the film having a difference in surface tension of at least about 10 mN/m relative to said coating system.

5,487,951

MAGNETIC RECORDING MEDIUM WITH A BINDER RESIN OF A STARBLOCK COPOLYMER HAVING AT LEAST SIX ARMS

Christopher M. Evans, Walden, and Colin F. W. Norman, Bishop's Stortford, both of, England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

PCT No. PCT/US92/05705, § 371 Date Jan. 7, 1994, § 102(e) Date Jan. 7, 1994, PCT Pub. No. WO93/01592, PCT Pub. Date Jan. 21, 1993

PCT Filed Jul. 7, 1993, Ser. No. 175,439

Claims priority, application United Kingdom, Jul. 8, 1991, 914668

Int. Cl.[6] G11B *5/00*

U.S. Cl. 428—523 **7 Claims**

1. A magnetic recording medium comprising a magnetic paint coated on a nonmagnetic support, wherein the magnetic paint comprises magnetizable particles dispersed in a polymeric binder, wherein the binder consists essentially of a star block copolymer of general formula (I):

$$(A\text{-}B)_m\text{-}X$$

in which;

X represents a polyfunctional coupling moiety and each (A-B) represents a polymeric arm radiating from the polyfunctional coupling moiety X,

m has a number average value of at least 6,

A represents a polymeric segment having a glass transition temperature of at least 75° C. and B represents a polymeric segment having a glass transition temperature no greater than 25° C., wherein polymeric segment A is incompatible with the polymeric segment B, and wherein each arm (A-B) may comprise one or more polymeric segments A and one or more polymeric segments B with the proviso that the polymeric segments A comprise at least 50% of the total weight of the star block copolymer and the free ends of the arms (A-B) comprise the polymeric segment A.

5,487,952

SINTERED BI2TE3-BASED THERMOELECTRIC MATERIALS PREVENTING P- TO N-TYPE TRANSITION

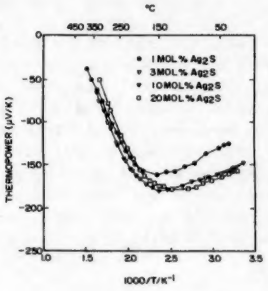
Han-Ill Yoo, 329, Mokdong Apt. 1405-704, Sinjeong-Dong, Yangcheon-Ku, Seoul; Tae Ho Park, 527-3, Somang Villa 201, Wooman-Dong, Paldal-Ku, Suwon; Dae Suk Kang, Garamdongsan Apt. 13-505, Samcheon-Dong, Seo-Ku, Daejon, and Beoung Doo Yoo, 1-38, Munhwa-Dong, Jung-Ku, Daejon, all of, Rep. of Korea

Filed Nov. 18, 1994, Ser. No. 342,356

Claims priority, application Rep. of Korea, Nov. 20, 1993, 1993-24863

Int. Cl.[6] B22F *3/10;7/00*

U.S. Cl. 428—552 **4 Claims**



1. A Bi_2Te_3-based thermoelectric material that contains Ag_2S, said Ag_2S being present in an amount up to 20 mol % for preventing p- to n-type transition during sintering.

5,487,953

ORGANIC ELECTROLUMINESCENT DEVICE

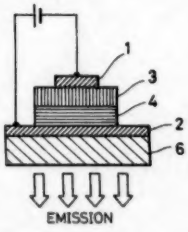
Yasuhiro Shirota, Toyonaka; Hiroshi Inada, Kobe; Yoshinobu Yonemoto, Tsurugashima; Takeo Wakimoto, Tsurugashima, and Kunio Imai, Tsurugashima, all of, Japan, assignors to Pioneer Electronic Corporation, Tokyo, and Bando Chemical Industries, Ltd., Kobe, both of, Japan

Filed Sep. 20, 1994, Ser. No. 309,538

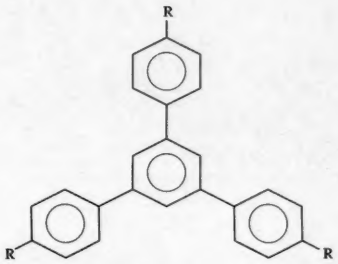
Claims priority, application Japan, Sep. 22, 1993, 5-236729

Int. Cl.[6] H05B *33/20;* **H01J** *1/62*

U.S. Cl. 428—690 **2 Claims**



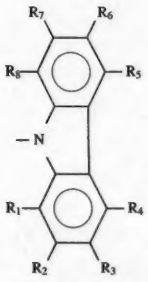
1. An organic electroluminescent device comprising a cathode, an emitting layer of organic compound, a hole transport layer of organic compound and an anode which are laminated in sequence, wherein said hole transport layer is made of a triphenylbenzene derivative represented by the following formula (1):



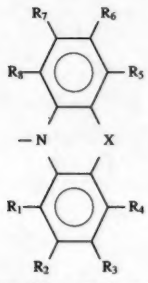
(I)

where R each independently represents one of functional groups represented by (Ra), (Rb) and (Rc):

(Ra)



(Rb)



(Rc)

where R_1–R_8 denote independently a hydrogen atom, an alkyl group, an aryl group, an alkoxy group, an acyl group or an aralkyl group, and X denotes an oxygen atom, a sulfur atom or a selenium atom.

5,487,954

NON-ACICULAR MODIFIED HIGH COERCIVITY IRON OXIDES FOR HIGH DENSITY MAGNETIC RECORDING AND THE PROCESSES OF MAKING THE SAME

Tsung-Shune Chin, and Ming-Cheng Deng, both of Hsinchu, Taiwan, Prov. of China, assignors to National Science Council, Taipei, Taiwan, Prov. of China

Filed Dec. 4, 1991, Ser. No. 802,354

Int. Cl.[6] **G11B** *5/66;* **C04B** *35/00;* **C01G** *49/02*

U.S. Cl. 428—694 B **22 Claims**

8. A magnetic recording medium made of non-acicular modified iron oxide having high coercivity and with a general formula of gamma $(Fe,M)_2O_3$, wherein M are doped elements to replace iron and are chosen from the group consisting of manganese, cobalt and zinc wherein the total amount of M-ions is 15 to 40 weight percent, corresponding to 14.5 to 39 atomic percent, of the total cations; wherein said manganese dopant is 4 to 20 weight percent corresponding to 4.1 to 20.5 atomic percent, said cobalt dopant is 4 to 22 weight percent corresponding to 3.5 to 21 atomic percent and said zinc dopant is 0.5 to 4 weight percent corresponding to 0.3 to 3.6 atomic percent.

5,487,955

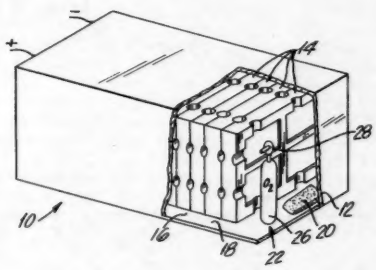
COOLED ZINC-OXYGEN BATTERY

Menachem Korall; Yehuda Harats; Boris Dechovich; Jonathan R. Goldstein, all of Jerusalem, and Binyamin Koretz, Efrat, all of, Israel, assignors to Electric Fuel (E.F.L.) Ltd., Jerusalem, Israel

Continuation-in-part of Ser. No. 286,539, Aug. 5, 1994, Pat. No. 5,445,901, which is a continuation-in-part of Ser. No. 213,674, Mar. 15, 1994, Pat. No. 5,366,822. This application Feb. 13, 1995, Ser. No. 387,277

Int. Cl.[6] **H01M** *10/50;12/06*

U.S. Cl. 429—26 **17 Claims**



1. A multi-cell, sealed, cooled, zinc-oxygen battery, comprising a container containing:

a) a plurality of bi-cells, each cell having a housing provided with two major surfaces and accommodating a pair of oppositely-disposed, spaced-apart, air-permeable, liquid-impermeable cathodes in the form of oxygen-reduction electrodes, and defining between themselves a cavity configured to accommodate an anode of said battery and electrolyte, substantial portions of the major surfaces of said housing being removed, thus exposing major portions of said oxygen-reduction electrodes, and wherein two major surfaces are partly recessed in such a way as to form, in conjunction with a similarly-recessed outer surface of a major wall of an adjacent cell housing, an inter-cathode gas space between adjacent cells with a plurality of oxygen access openings leading thereto;

b) an anode positioned within said cavity and comprising an active zinc anode component compacted into a rigid static bed of active anode material of tight interparticulate structure, said anode being provided with at least one internal fluid-carrying passage with inlet and outlet means, for circulating cooling fluid therethrough;

c) a dead space volume between inner surfaces of said housing and said plurality of bi-cells; and

d) pressurized oxygen supply means for feeding oxygen to said dead space volume, for consumption in said inter-cathode gas spaces.

5,487,956

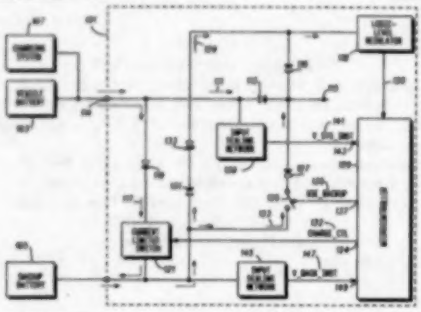
ADAPTIVE BACKUP BATTERY MANAGEMENT FOR VEHICULAR BASED ELECTRONIC MODULES

Steven D. Bromley, 9804 Woodshire Dr., Austin, Tex. 78748; James F. Herrmann, 112 Cedar Dr., Buda, Tex. 78610, and Mark V. Emery, 6115 Oliver Loving Trail, Austin, Tex. 78749

Filed Sep. 16, 1994, Ser. No. 308,014

Int. Cl.[6] H01M *10/48*

U.S. Cl. 429—90 **9 Claims**



6. A backup battery management apparatus having a backup battery and a charging system driving a vehicle battery, the apparatus comprising:

first averaging means for averaging a voltage derived from the vehicle battery at a first rate and providing a short-term average system voltage in response thereto;

second averaging means for averaging the short-term average system voltage, at a second rate lesser than the first rate, and providing a long-term average voltage in response thereto; and

means for charging the backup battery from the charging system , while the short-term average system voltage exceeds the long-term average voltage by a predetermined threshold.

5,487,957

METHOD AND APPARATUS FOR CONVERTING CHEMICAL AND THERMAL ENERGY INTO ELECTRICITY

Meredith Gourdine, Pearland, Tex., assignor to Energy Innovations, Inc., Houston, Tex.

Continuation of Ser. No. 671,097, Mar. 18, 1991, abandoned, which is a continuation of Ser. No. 398,062, Aug. 24, 1989, abandoned, which is a division of Ser. No. 14,442, Feb. 13, 1987, Pat. No. 4,916,033. This application Sep. 2, 1992, Ser. No. 939,854

Int. Cl.[6] H01M *2/14*

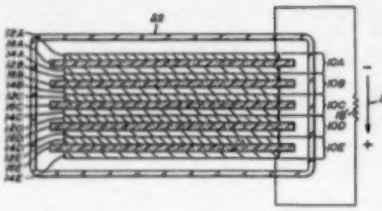
U.S. Cl. 429—49 **14 Claims**

1. A thermovoltaic cell, comprising:

a first electrode made of an electrically conductive material;

a second electrode made of a metal; and

a porous nonmetallic solid separator that readily passes gaseous oxygen ions therethrough located adjacent to and between the first electrode and the second electrode, the first and second electrodes each having a different oxidation-reduction reaction occurring at the interface with the nonmetallic separator.



5,487,958

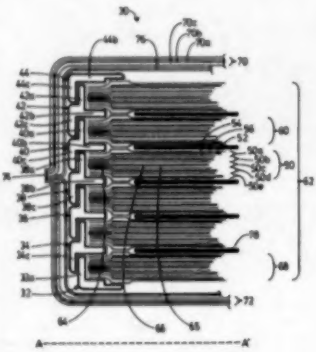
INTERLOCKING FRAME SYSTEM FOR LITHIUM-POLYMER BATTERY CONSTRUCTION

Drew Tura, 1965 Harmil Way, San Jose, Calif. 95125

Filed Dec. 6, 1993, Ser. No. 163,203

Int. Cl.[6] H01M *10/04*

U.S. Cl. 429—151 **13 Claims**



1. A battery comprising:

a stack of planar battery cells; and

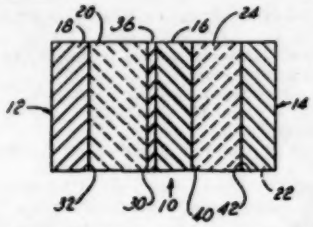
a plurality of interlocking frames, said plurality of interlocking frames adapted to restrict the planar battery cells from slipping with respect to each other; the interlocking frames including a first frame with a ledge in a first plane, the first frame including an upwards projection and a downwards projection out of the ledge; the interlocking frames including a second frame with a ledge in a second plane, said second plane being parallel to the first plane, said second frame including an upwards projection and a downwards projection out of the ledge, wherein some of the cells in said stack of cells are located between the ledges of the first and second frames and wherein one of the projections from the first frame is located behind one of the projections of the second frame such that the movement of the first and second frames within the planes of the ledges is restricted, and wherein the thickness of said some of the cells between the ledges is such that the one of the projections from the first frame does not contact the ledge of the second frame and the one of the projections of the second frame does not contact the ledge of the first frame.

5,487,959

LAYER FOR STABILIZATION OF LITHIUM ANODE

Rene Koksbang, 4231 Norwalk Dr., No. EE101, San Jose, Calif. 95129

Continuation of Ser. No. 40,228, Mar. 30, 1993, Pat. No. 5,342,710. This application Jul. 6, 1994, Ser. No. 271,302
The portion of the term of this patent subsequent to Aug. 30, 2011, has been disclaimed.
Int. Cl.[6] H01M 6/18
U.S. Cl. 429—191 12 Claims



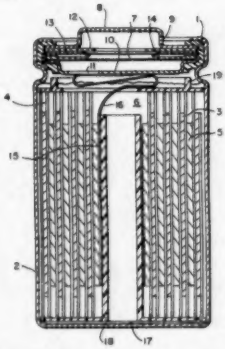
1. In a battery comprising a negative electrode body having an active material which comprises metallic lithium, and an electrolyte separator comprising a solid matrix material and an electrolyte having a salt of lithium, the negative electrode having a major surface facing the matrix material, the improvement comprising a layer disposed between the matrix material and the surface of the negative electrode body facing the matrix material, said layer being electronically conductive and ionically conductive of lithium ions and comprising a polymer and iodine dispersed with said polymer, said polymer having a number of monomers, each of such monomers having an electron donor pyridine-based unit forming a charge transfer complex with said iodine for reducing passivation of said lithium-containing negative electrode, said pyridine-based unit selected from the group consisting of vinylpyridine monomers, vinylpyridine monomers carrying one or more substituents off of the pyridine ring, polycyclics where the vinylpyridine constitutes one of the fused rings, and mixtures thereof.

5,487,960

NONAQUEOUS SECONDARY BATTERY

Mitsutoshi Tanaka, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 3, 1995, Ser. No. 434,052
Claims priority, application Japan, May 12, 1994, 6-098673
Int. Cl.[6] H01M 4/36;4/02
U.S. Cl. 429—218 12 Claims



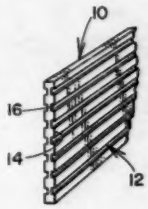
1. A nonaqueous secondary battery comprising a positive electrode, negative electrode and an nonaqueous electrolytic solution, wherein the positive electrode comprises a mixture of active material and an acid containing at least one of P, B, Si, Mo, and W or a salt thereof.

5,487,961

SINTERED METAL ELECTRODE

Bradley D. Strangways, and Dale E. Ritter, both of Gainesville, Fla., assignors to Eveready Battery Company, Inc., St. Louis, Mo.

Continuation of Ser. No. 873,479, Apr. 24, 1992, abandoned.
This application May 24, 1994, Ser. No. 248,590
Int. Cl.[6] H01M 4/36;4/64
U.S. Cl. 429—223 15 Claims



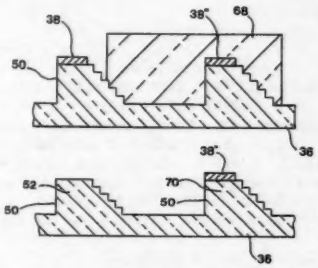
1. A flexible sintered metal electrode for use in a rechargeable cell, comprising:
a) an electrically conductive substrate having a longitudinal axis;
b) a sintered metal plaque deposited on said substrate and transversely scored relative to said substrate's longitudinal axis; and
c) electrochemically active material associated with said plaque.

5,487,962

METHOD OF CHROMELESS PHASE SHIFT MASK FABRICATION SUITABLE FOR AUTO-CAD LAYOUT

J. Brett Rolfson, 6225 HolliLynn, Boise, Id. 83704

Filed May 11, 1994, Ser. No. 240,994
Int. Cl.[6] G03F 9/00
U.S. Cl. 430—5 20 Claims

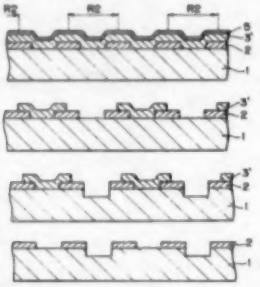


1. A method for forming a chromeless phase shifting photomask comprising:
forming a pattern of features on a transparent substrate said features having sidewalls and a terminating edge;
forming a layer of resist over one sidewall and the terminating edge of the features;
forming a vertical edge in the substrate along one sidewall of each feature to a predetermined depth into the substrate;
forming a tapered edge in the substrate along the sidewall covered with resist and along the terminating edge, said tapered edge extending with a predetermined slope into the substrate to the predetermined depth;
stripping the resist; and
stripping the pattern of features to form raised phase shifters each having a vertical edge on one side and a tapered edge along one side and the terminating edge, with the slope of the tapered edge selected to prevent null formation during a lithographic process utilizing the photomask.

5,487,963
PHASE SHIFTING MASK WHEREIN LIGHT TRANSMITTED THROUGH SECOND TRANSMISSION AREAS INTENSIFIES LIGHT THROUGH FIRST TRANSMISSION AREAS

Minoru Sugawara, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 26, 1994, Ser. No. 296,461
Claims priority, application Japan, Aug. 27, 1993, 5-235561
Int. Cl.[6] G03F *9/00*
U.S. Cl. 430—5 **8 Claims**



1. A phase shifting mask, comprising:
a transparent substrate;
a light shielding area formed on said transparent substrate;
a plurality of first light transmission areas of a rectangular shape patterned on said transparent substrate; and
a plurality of second light transmision areas patterned in an alternate relationship in two perpendicular directions from said first light transmision areas on said transparent substrate, said second light transmission areas being spaced from said first light transmission areas and constructed so that light having transmitted through said second light transmission areas intensifies the intensity of light having transmitted through said first light transmission areas, said second light transmission areas having a substantially same profile as that of said first light transmission areas.

5,487,964
POWDER MIXTURES FOR METALLIZATION OF SUBSTRATE SURFACES

Günther Reichert, Köln; Hans Lietz, Odenthal; Jürgen-Rolf Hassdenteufel, Bergisch Gladbach; Günter Sackmann, and Frank Kobelka, both of Leverkusen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jun. 8, 1994, Ser. No. 255,506
Claims priority, application Germany, Jun. 15, 1993, 43 19 759.0
Int. Cl.[6] C23C *18/30*
U.S. Cl. 430—16 **13 Claims**

1. A spray powder formulation for direct application to substrate surfaces or for application to substrate surfaces by electrophotographic processes in the form of a thin layer, and stoving of said thin layer by heat treatment or by high-energy radiation, deposition of firmly adhering layers of metal by currentless, wet-chemical metallization, comprising a pulverulent, non-conductive material and a (semi-) noble metal compound in an amount of 0.1–10% by weight, based on the total weight of powder formulation and calculated as the metal, wherein said pulverulent non-conductive material has a size of 5–90 μm and is a mixture comprising
(a) a polymer selected from the group consisting of (meth)acrylate, polyester, epoxide-polyester, epoxy resin, polyurethane, polyethylene, polypropylene and other polyolefins, polyvinyl chloride, polyamide, cellulose ester, (chlorinated) polyether, ethylene/vinyl acetate copolymer and mixtures thereof;
(b) a pigment in an amount of 5–20%,
(c) fillers in an amount of 0–70%,
(d) charge control agents in an amount of 0–5% by weight,
and wherein said (semi-) noble metal compound is selected from the group consisting of complex compounds or inorganic salts of the elements Cu, Au, Ag, Pt, Pd and Ru in amounts of from 0.2 to 8 by weight, all the percentage data being based on the powder formulation and the polymer representing the remainder to make up to 100% by weight, of pulverulent non-conductive material.

5,487,965
PROCESSES FOR THE PREPARATION OF DEVELOPER COMPOSITIONS

Peter G. Odell, Mississauga, Canada, assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 6, 1994, Ser. No. 300,548
Int. Cl.[6] G03G *9/125*
U.S. Cl. 430—137 **28 Claims**

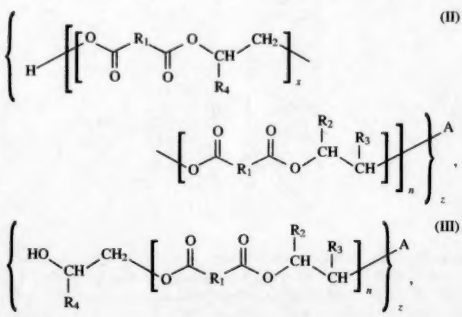
1. A process for preparing a liquid developer composition comprising:
a) forming a melt mixture comprised of a polymer resin or resins, a colorant, a charge director additive, and a hydrocarbon liquid carrier, to obtain a first suspension of colored polymeric particles with an area average diameter of from about 2 to about 100 microns;
b) dispersing said first suspension in a supercritical fluid medium and thereafter continuously feeding the resultant dispersion to a liquid fluidizing means under pressure to obtain a second suspension comprising a supercritical fluid and liquid developer mixture containing colored polymeric particles with an area average diameter of from about 0.1 to about 10 microns; and
c) reducing the pressure to evaporate, and optionally recovering, the supercritical fluid medium from said second suspension, wherein there results a liquid developer mixture containing colored polymeric particles with an area average diameter of less than about 3.0 microns and a solids content of about 10 to about 90 weight percent.

5,487,966
PHOTOSENSITIVE COMPOSITIONS

Bettina Steinmann, Praroman; Adrian Schulthess, Tentlingen, and Max Hunziker, Düdingen, all of, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 891,540, Jun. 1, 1992, abandoned.
This application Apr. 21, 1994, Ser. No. 231,953
Claims priority, application Switzerland, Jun. 4, 1991, 1667/91
Int. Cl.[6] G03C *5/00;1/492;1/725*
U.S. Cl. 430—269 **15 Claims**

1. A photosensitive composition for production of a three-dimensional object by means of a stereolithographic process comprising
a) 5–95% by weight of a polyester of formula II or III



wherein

R_1 is the radical of a cyclic anhydride of a dicarboxylic acid after removal of the —O—CO—O— grouping, which radical may be substituted by C_1–C_{22}alkyl, C_5–C_{10}cycloalkyl, C_3–C_6alkenyl, C_6–C_{10}aryl, halogen or C_1–C_{22}alkyl which is interrupted by —O— or —CO—O—,

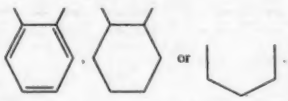
R_2 is hydrogen, unsubstituted or halogen-substituted C_1–C_{22}alkyl, C_5–C_{10}cycloalkyl, C_7–C_{12}aralkyl, C_6–C_{10}aryl or a radical —CH_2—O—R_5 or —CH_2—O—CO—R_5, wherein R_5 is C_1–C_{22}alkyl, C_5–C_6cycloalkyl or C_6–C_{10}aryl,

R_3 is hydrogen, or

R_2 and R_3, together with the linking carbon atoms, are a cyclopentylene or cyclohexylene radical,

R_4 is a radical of 4 to 12 carbon atoms which carries an unsaturated end group and carboxyl or ether groups,

wherein A in formulae II and III is a radical H_3C—$(CH_2)_y$—CO—O—, H_3C—$(CH_2)_y$—O—, —O—CO—$(CH_2)_y$—CO—O—, —O—$(CH_2)_y$—O— or



wherein

R_7 is methyl or hydrogen if m=1 or, if m=2–4, is hydrogen,

n=2–150 and y is an integer from 2–20, or wherein A is derived from a linear or branched polyethylene glycol or polypropylene glycol or a copolymer of these two glycols or a carboxyl-terminated polyester,

x is an integer from 0–100,

n is an integer from 2–150, and

z is an integer from 1–4,

b) 10–90% by weight of a liquid polyfunctional aliphatic, cycloaliphatic or aromatic (meth)acrylate, which is a mixture of a di(meth)acrylate and a tri(meth)acrylate,

c) 0–70% of a mono(meth)acrylate or mono-N-vinyl compound with a molecular weight of not more than 500,

d) 0.1–10% by weight of a photoinitiator, and

e) 0–10% by weight of optional customary additives.

5,487,967

SURFACE-IMAGING TECHNIQUE FOR LITHOGRAPHIC PROCESSES FOR DEVICE FABRICATION

Richard S. Hutton, Summit; Gary N. Taylor, Bridgewater, both of N.J., and David R. Wheeler, Albuquerque, N.M., assignors to AT&T Corp., Murray Hill, N.J.

Continuation-in-part of Ser. No. 68,485, May 28, 1993. This application Feb. 17, 1995, Ser. No. 390,733

Int. Cl.[6] G03F *7/38*

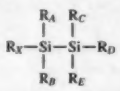
U.S. Cl. 430—322 **22 Claims**

1. A process for manufacturing a device comprising: depositing an imaging layer comprising a polymeric resist material on a substrate; exposing a portion of the imaging layer to radiation, thereby forming an exposed region and an unexposed region that together define an image of a pattern in the imaging layer; introducing into the imaging layer a refractory material comprising a silylating reagent that is selectively permeable into one of either the exposed region or the unexposed region of the imaging layer, in combination with about 0.5 volume percent to about 25 volume percent of a silicon-containing cross-linking reagent characterized by the formula:

$$R_n—G—X_m$$

wherein m is greater than or equal to 2, n is greater than or equal to zero, m is at least 2, X is a reactive group that reacts with a functional group pendant to the polymeric resist material, the reaction causing the remaining portion of the cross-linking reagent, R_nG to bind to the polymeric resist material, G is a connecting moiety, and R groups are all selected from the group consisting of H and alkyl, wherein the R groups are the same or different, and developing the pattern in the imaging layer.

16. A process for manufacturing a device comprising: obtaining a substrate; depositing a planarizing layer comprising a polymeric resist material substrate; depositing an imaging layer comprising a polymeric resist material with pendant functional groups on the planarizing layer; exposing a portion of the imaging layer to radiation, thereby forming an exposed region and an unexposed region that together define an image of a pattern in the imaging layer; introducing into the imaging layer a refractory material comprising an organodisilane that is selectively permeable into one of either the exposed region or the unexposed region of the imaging layer, the refractory material characterized by the formula:



wherein R_x is a reactive group that selectively reacts with the functional groups pendant to the polymeric resist material in one of either the exposed region or the unexposed region of the imaging layer, the reaction producing a reactive site with which the remaining portion of the refractory material, $SiR_A\ R_BSiR_CR_DR_E$, reacts, and groups $R_{(A\text{-}E)}$ are all selected from the group consisting of H and CH_3 wherein $R_{(A\text{-}E)}$ are the same or different and wherein at least two of $R_{(A\text{-}E)}$ are CH_3 and wherein the refractory material is combined with a cross-linker having the general formula

$$R_n—Si_a—X_m$$

wherein a is greater than or equal to 1, n is less than or equal to 2a and m is greater than or equal to 2, X is a reactive group that reacts with functional groups pendant to the polymeric resist material and R is selected from the group consisting of H and alkyl, and wherein the cross-linker cross-links at least some of the polymeric resist material; and developing the pattern in the imaging layer.

5,487,968

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Yuki Mizukawa, and Hidetoshi Kobayashi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 12, 1994, Ser. No. 321,980

Claims priority, application Japan, Jan. 12, 1993, 5-277332

Int. Cl.[6] G03C *7/305*

U.S. Cl. 430—544 **10 Claims**

1. A silver halide photographic material having at least one silver halide emulsion layer and at least one compound represented by a general formula (I) on a support:

$$A\text{-}(TIME)_m\text{-}(RED)_n\text{-}Q \qquad (I)$$

wherein A represents a group capable of releasing $(TIME)_m$-$(RED)_n$-Q by a reaction with an oxidation product of an aromatic primary amine developing agent;

TIME represents a timing group capable of releasing $(RED)_n$-Q after having been released from A;

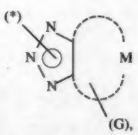
RED represents a group capable of releasing Q by reaction with an oxidation product of an aromatic primary amine developing agent after having been released from TIME;

Q represents a group of the following general formula (II);

m represents 0, 1 or 2;

n represents 0 or 1; and

when m is 2, two TIME groups may be the same or different:



(II)

wherein M has at least one hetero atom selected from the group consisting of oxygen, sulfur and nitrogen atoms and repre-

sents a non-metallic atomic group necessary for forming a 5-membered, 6-membered or 7-membered hetero-ring along with the two carbon atoms in the 1,2,3-triazole ring moiety in the formula; G represents a substituent;

f represents 0 or an integer of from 1 to 5; and when f is 2 or more, two or more G groups may be the same or different; and

(*) indicates the position at which the group bonds to A-$(TIME)_m$-$(RED)_n$-;

wherein the at least one hetero atom in M in formula (II) is (1) at least one nitrogen atom and at least one oxygen or sulfur atom or (2) at least one nitrogen atom;

wherein A is a coupler residue selected from the group consisting of pivaloylacetanilides, benzoylacetanilides, malonic diesters, malondiamides, dibenzoylmethanes, benzothiazolylacetamides, malonic ester monoamides, benzoxazolylacetamides, benzimidazolylacetamides, cylcoalkanoylacetamides, 5 -pyrazolone, pyrazolobenzimidazoles, pyrazolotriazoles, pyrazoloimidazoles, imidazotriazoles, cyanoacetophenones, phenols, naphthols, indanones and acetophenones.

5,487,969

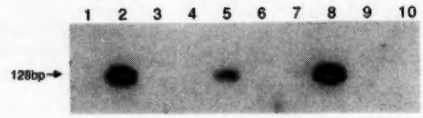
METHOD OF DETECTION OF HERPES B VIRUS

Richard Eberle; Darla Black, both of Stillwater, Okla.; Franco Scinicariello, and Julia Hilliard, both of San Antonio, Tex., assignors to Southwest Foundation for Biomedical Research, San Antonio, Tex.

Filed Apr. 1, 1993, Ser. No. 42,747

Int. Cl.[6] C12Q *1/70*

U.S. Cl. 435—5 **6 Claims**



1. A method for detecting the presence of herpes B virus in an individual, the method comprising the steps of:

a) obtaining a tissue sample or a culture sample from an individual suspected of being infected with herpes B virus;

b) extracting DNA from the tissue or culture sample;

c) amplifying DNA segments from the extracted DNA by using a sense primer sequence consisting of BV1 (SEQ ID NO:1:) and an anti-sense primer sequence consisting of BV2(SEQ ID NO:2:); and

d) analyzing the amplified DNA segments to detect the presence of the DNA segment (SEQ ID NO:4:), the DNA segment (SEQ ID NO:4:) being detectable either by:

i) digesting the amplified DNA segments with a restriction enzyme, said restriction enzyme being capable of digesting the DNA segment (SEQ ID NO:4:)but not capable of digesting HSV1 or HSV2; separating the digested segments by size; and detecting the presence or absence of digested segments; or

ii) hybridizing the amplified DNA segments with labeled oligonucleotide probe consisting of PB5 (SEQ ID NO:3:) and detecting the presence or absence of hybridized segments;

wherein the presence of the DNA segment (SEQ ID NO:4:)indicates the presence of the virus.

5,487,970

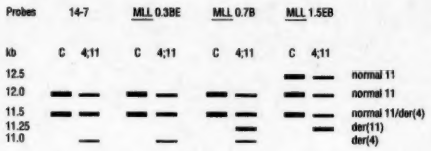
COMPOSITIONS AND METHODS FOR DETECTING GENE REARRANGEMENTS AND TRANSLOCATIONS

Janet D. Rowley, and Manuel O. Diaz, both of Chicago, Ill., assignors to Arch Development Corp., Chicago, Ill.

Continuation-in-part of Ser. No. 991,244, Dec. 16, 1992, abandoned, which is a continuation-in-part of Ser. No. 900,689, Jun. 17, 1992, abandoned. This application Jun. 17, 1993, Ser. No. 80,255

Int. Cl.[6] C12Q *1/68*

U.S. Cl. 435—6 **22 Claims**



1. A method of detecting a 11q23 chromosome translocation in leukemic cells, comprising:

(a) obtaining genomic DNA from leukemic cells suspected of containing a 11q23 chromosomal translocation;

(b) digesting the DNA with one or more restriction enzymes; and

(c) hybridizing the digested DNA with a nucleic acid probe that consists essentially of the sequence of a 0.7 kb BamH1 restriction fragment from the MLL gene wherein hybridization of the probe with aberrant sized DNA segments is indicative of a 11q23 chromosome translocation.

5,487,971

SYNTHETIC, PLASMA-FREE, TRANSFUSIBLE STORAGE MEDIUM FOR RED BLOOD CELLS AND PLATELETS

Stein Holme, Virginia Beach, and William A. L. Heaton, Norfolk, both of Va., assignors to American National Red Cross, Washington, D.C.

Continuation of Ser. No. 593,932, Oct. 5, 1990, Pat. No. 5,248,506, which is a continuation-in-part of Ser. No. 99,012, Sep. 21, 1987, Pat. No. 4,961,928, which is a continuation-in-part of Ser. No. 841,435, Mar. 19, 1986, Pat. No. 4,695,460. This application Sep. 28, 1993, Ser. No. 128,066

Int. Cl.[6] A61K *35/18;35/14;* A01N *1/02*

U.S. Cl. 435—2 **4 Claims**

1. A process for preserving red blood cells in a sterile, plasma-free red blood cell storage medium comprising:

preparing a physiologically compatible, aqueous electrolyte solution, one liter of said electrolyte solution having:

an effective concentration of adenine:

between about 3.0 grams and about 25.0 grams of dextrose;

between about 3.0 grams and 6.0 grams of sodium citrate; and

between about 2.0 grams and about 4.2 grams of sodium bicarbonate;

suspending red blood cells in said red blood cell storage medium, said red blood cell storage medium being isotonic and having a pH in a range of between about 6.8 and about 7.4, whereby said effective concentration of adenine is sufficient for a substantial concentration of said red blood cells to remain viable for at least about 49 days at a temperature of at least about 4° C.

5,487,972
NUCLEIC ACID DETECTION BY THE 5'–3'EXONUCLEASE ACTIVITY OF POLYMERASES ACTING ON ADJACENTLY HYBRIDIZED OLIGONUCLEOTIDES

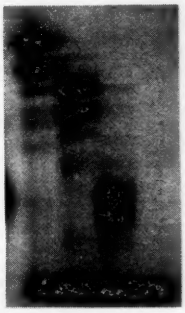
David H. Gelfand, Oakland, Calif.; Pamela M. Holland, Seattle, Wash.; Randall K. Saiki, Richmond, and Robert M. Watson, Berkeley, both of Calif., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 563,758, Aug. 6, 1990, Pat. No. 5,210,015. This application Jan. 5, 1993, Ser. No. 961,884

The portion of the term of this patent subsequent to May 11, 2010, has been disclaimed.

Int. Cl.[6] C12Q *1/68;* **C12P** *19/34*

U.S. Cl. 435—6 **32 Claims**



1. A process for the detection or measurement of a target nucleic acid sequence in a sample, said process comprising:

(a) contacting a sample comprising single-stranded nucleic acids with an oligonucleotide containing a sequence complementary to a region of the target nucleic acid and a labeled oligonucleotide containing a sequence complementary to a second region of the same target nucleic acid sequence strand, but not including the nucleic acid sequence defined by the fast oligonucleotide, to create a mixture of duplexes during hybridization conditions, if the target nucleic acid sequence is present in the sample, wherein the duplexes comprise the target nucleic acid annealed to the fast oligonucleotide and to the labeled oligonucleotide such that the 3' end of the first oligonucleotide is adjacent to the 5' end of the labeled oligonucleotide;

(b) maintaining the mixture of step (a) with a template-dependent nucleic acid polymerase having a 5' to 3' nuclease activity under conditions sufficient to permit the 5' to 3' nuclease activity of the polymerase to cleave the annealed, labeled oligonucleotide and release labeled fragments; and

(c) detecting and/or measuring the release of labeled fragments and thereby detecting and/or measuring the target nucleic acid in the sample.

5,487,973
METHODS FOR DETECTING AND ASSAYING NUCLEIC ACID SEQUENCES

Thor W. Nilsen, Glen Mills, Pa., and Wolf Prensky, Fairlawn, N.J., assignors to PolyProbe, Inc., Media, Pa.

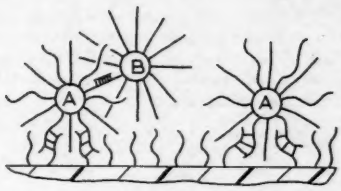
Division of Ser. No. 906,222, Sep. 10, 1986, Pat. No. 5,175,270. This application Oct. 19, 1992, Ser. No. 963,107

Int. Cl.[6] C12Q *1/68*

U.S. Cl. 435—6 **27 Claims**

1. A method of determining the presence of a specific sequence of nucleotides in a nucleic acid target molecule in a sample by detecting the presence of a hybrid thereof, and not detecting the hybrid in the absence thereof which comprises;

(A) providing a reagent for the detection and assay of the sequence of nucleotides in the nucleic acid target molecule, which comprises;



(a) a plurality of molecules, each of which comprises a first partially double-stranded polynucleotide having a structure comprising a first molecule end, a second molecule end and a double-stranded body portion intermediate of the first and second ends thereof; said first and second ends thereof each having at least one of first and second arms consisting of a single strand of polynucleotide; said single strands being hybridizable with a pre-determined sequence of nucleotides in a nucleic acid; the first and second arms of each of said first and second ends being non-hybridizable with each other;

(b) a plurality of molecules, each of which comprises a second partially double-stranded polynucleotide having a structure comprising a first molecule end, a second molecule end and a double-stranded body portion intermediate of the first and second ends thereof; said first and second ends thereof each having at least one of first and second arms thereof consisting of a single strand of polynucleotide; said single strands being hybridizable with a pre-determined sequence of nucleotides in a nucleic acid; the first and second arms of each of said first and second ends being non-hybridizable with each other;

said plurality of molecules of the first polynucleotide and the second polynucleotide being joined through annealing of one or more arms thereof, to form a matrix; and

at least one non-annealed arm of said plurality of first and second polynucleotide molecules located on the surface of the matrix being free to hybridize and capable of hybridizing with the sequence of nucleotides in the nucleic acid target molecule, the presence of which is to be determined;

(B) contacting the reagent with the sample under hybridization conditions such that the at least one non-annealed arm of the matrix can hybridize with sequence of nucleotides in the nucleic acid target molecule, only if present in the sample to form the hybrid thereof; and

(C) detecting the presence of the hybrid, if present, as indicative of the presence of the specific sequence of nucleotides in a nucleic acid target molecule.

5,487,974
METHOD FOR DETECTING COMPLEXES CONTAINING HUMAN LEUKOCYTE ANTIGEN A2 (HLA-A2) MOLECULES AND A TYROSINASE DRIVED PEPTIDE ON ABNORMAL CELLS

Thierry Boon-Falleur; Vincent Brichard; Aline Van Pel; Etienne De Plaen; Pierre Coulie; Jean-Christope Renauld, all of Brussels; Thomas Wölfel, Mainz, and Bernard Lethé, Brussels, all of, Belgium, assignors to Ludwig Institute for Cancer-Research, New York, N.Y.

Continuation-in-part of Ser. No. 54,714, Apr. 28, 1993, which is a continuation-in-part of Ser. No. 994,928, Dec. 22, 1992, abandoned. This application Jun. 23, 1993, Ser. No. 81,673

Int. Cl.[6] C12Q *1/68;1/02;* **G01N** *33/574*

U.S. Cl. 435—6 **6 Claims**

1. Method for determining presence of cytolytic T cells specific

for complexes of an HLA-A2 molecule and the peptide of SEQ ID NO: 3 in a blood sample, comprising contacting a blood sample of interest with cells which present said complexes on their surface, and determining (i) proliferation of cytolytic T cells and (ii) lysis of cells presenting said complexes, as a determination of said cytolytic T cells in said blood sample.

5,487,975

BIOTIN/AVIDIN FORMULATION

Phillip C. Miller; Roberta L. Druyor, and Ralph R. Martel, all of Tucson, Ariz., assignors to Ventana Medical Systems, Inc., Tucson, Ariz.

Filed Nov. 15, 1993, Ser. No. 152,864

Int. Cl.[6] G01N *33/535*

U.S. Cl. 435—7.5 **14 Claims**

1. A biotin-avidin formulation comprising a conjugate selected from the group consisting of a biotinylated antibody conjugate and an avidin-enzyme conjugate in a suitable diluent for immunohistochemical staining, said diluent additionally comprising:

(a) casein in an amount sufficient to prevent charge interactions of the conjugate with a tissue section; and

(b) gamma globulin prepared from nonimmune serum in an amount sufficient to prevent Fc receptor binding and any hydrophobic interaction of the conjugate with a tissue section.

5,487,976

DNA ENCODING AN INSECT GAMMA-AMINOBUTYRIC ACID (GABA) RECEPTOR SUBUNIT CELLS EXPRESSING IT, AND PESTICIDE SCREENING METHODS USING SUCH CELLS

David M. Soderlund; Douglas C. Knipple, both of Geneva, and Joseph E. Henderson, Phelps, all of N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Oct. 15, 1993, Ser. No. 137,614

Int. Cl.[6] C12N *15/12;5/00;1/11;* **G01N** *33/68*

U.S. Cl. 435—7.21 **8 Claims**

2. An isolated DNA molecule encoding a γ-aminobutyric acid receptor subunit, said DNA molecule having the nucleotide sequence shown in SEQ ID NO: 3.

8. A method of screening a chemical agent for effectiveness as a pesticide, comprising:

transforming a host cell with the DNA molecule encoding an γ-aminobutyric acid receptor subunit according to claim **2** and at least one other DNA molecule encoding another γ-aminobutyric acid receptor subunit;

facilitating co-expression of said γ-aminobutyric acid receptor subunit encoded by said DNA molecule and said another γ-aminobutyric acid receptor subunit encoded by said other DNA molecule in the host cell, wherein said co-expression results in the formation and expression of an γ-aminobutyric acid receptor in the cell;

exposing the cell to a chemical agent; and

evaluating the exposed cell to determine if the receptor is the target site for the chemical agent, wherein if said receptor is the target site for said chemical agent, said chemical agent is effective as a pesticide.

5,487,977

METHOD FOR THE DETERMINATION OF SULFIDOLEUKOTRIENES IN TISSUES AND BIOLOGICAL FLUIDS AND ITS APPLICATION IN DIAGNOSIS OF ALLERGIES AND OTHER INFLAMMATORY DISEASES

Alain L. de Weck, 14, Grand Places, 1700 Fribourg, Switzerland

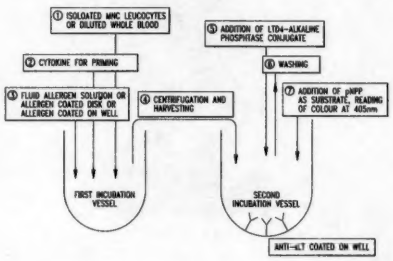
PCT No. PCT/EP92/02238, § 371 Date Jun. 1, 1993, § 102(e) Date Jun. 1, 1993, PCT Pub. No. WO93/07493, PCT Pub. Date Apr. 15, 1993

PCT Filed Sep. 25, 1992, Ser. No. 70,326

Claims priority, application Switzerland, Jan. 1, 1991, 2904/91

Int. Cl.[6] G01N *33/53;33/543*

U.S. Cl. 435—7.24 **22 Claims**


① ISOLOATED MNC LEUCOCYTES OR DILUTED WHOLE BLOOD
② CYTOKINE FOR PRIMING
③ ADDITION OF LTD4-ALKALINE PHOSPHTASE CONJUGATE
④ WASHING
⑤ FLUID ALLERGEN SOLUTION OR ALLERGEN COATED DISK OR ALLERGEN COATED ON WELL
⑥ CENTRIFUGATION AND HARVESTING
⑦ ADDITION OF pNPP AS SUBSTRATE, READING OF COLOUR AT 405nm
FIRST INCUBATION VESSEL
SECOND INCUBATION VESSEL
ANTI-sLT COATED ON WELL

1. A method for assessing cellular hypersensitivity of a human being to a stimulating agent comprising the following steps:

a) contacting a sample derived from the human being comprising one or more of the group consisting of basophils and leukocytes with a cytokine selected from the group consisting of IL3, IL5, GM-CSF and NGF under conditions suitable for said cytokine to prime said basophils or leukocytes, to provide a primed sample;

b) contacting said primed sample with a stimulating agent under conditions suitable for said stimulating agent to challenge said basophils or leukocytes, thereby causing said basophils or leukocytes to release one or more sulfidoleukotrienes (sLT) selected from the group consisting of LTC4, LTD4 and LTE4 if said basophils or leukocytes are sensitive to said stimulating agent, to provide a challenged sample;

c) contacting said challenged sample with a solid phase carrier-bound monoclonal antibody which specifically binds said sLT under conditions suitable for binding between said antibody and said sLT in said challenged sample;

d) adding an enzyme-labeled sulfidoleukotriene selected from the group consisting of LTC4, LTD4 and LTE4 to the challenged sample and said antibody; and

e) evaluating an amount of the enzyme-labeled sulfidoleukotriene bound to the carrier by an immunoenzymatic ELISA assay, and thereby determining the cellular hypersensitivity of the human being to said stimulating agent, said amount being in inverse proportion to an amount of released sLT bound to said carrier.

5,487,978

METHOD, COMPOSITION AND DEVICE FOR THE DETERMINATION OF CHOLESTEROL USING CHOLESTEROL OXIDASE OBTAINED FROM BACTERIAL STRAIN NRRL B-18713

Aurora F. deCastro, Union, Mich., and Surendra K. Gupta, Elkhart, Ind., assignors to GDS Technology, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 266,668, Nov. 3, 1988, abandoned. This application Mar. 5, 1991, Ser. No. 664,716

Int. Cl.[6] C12Q *1/60;1/28;* **C12N** *9/04*

U.S. Cl. 435—11 **23 Claims**

1. A test composition for the kinetic determination of cholesterol comprising an effective amount of cholesterol oxidase for determining cholesterol in sample obtained from Bacterial strain NRRL B-18713 in a suitable carrier.

5,487,979

DNA ENCODING HUMAN AND MURINE EPS15, A SUBSTRATE FOR THE EPIDERMAL GROWTH FACTOR RECEPTOR

Pier P. DiFiore, Bethesda, Md., and Francesca Fazioli, Ancona, Italy, assignors to The United States of America as represented by the Department of Health and Human Services, Washinton, D.C.

Continuation-in-part of Ser. No. 935,311, Aug. 25, 1992, Pat. No. 5,378,809. This application Jul. 22, 1993, Ser. No. 95,737

Int. Cl.[6] C12N *1/21;5/10;15/12;15/63*

U.S. Cl. 435—240.2 **10 Claims**

1. Isolated or purified polynucleotide operably encoding human eps15, wherein said polynucleotide comprises a sequence encoding the amino acid sequence of SEQ ID NO:2.

5,487,980

METHOD OF DETERMINING PROPENSITY OF DISSOLVED OXYGEN INSTABILITY

James R. Swartz, Menlo Park, Calif., assignor to Genentech, Inc., South San Francisco, Calif.

Division of Ser. No. 989,844, Nov. 23, 1992, Pat. No. 5,342,763. This application May 9, 1994, Ser. No. 240,121

Int. Cl.[6] C12Q *1/02*

U.S. Cl. 435—29 **9 Claims**

1. A method for determining the propensity of a bacterial cell culture for sudden changes in dissolved oxygen concentration in the culture medium in a large-scale fermentor comprising (a) culturing the cell culture in the presence of a carbon/energy source introduced at a set feed rate in a small-scale fermentor configured so that the dissolved oxygen concentration throughout the cell culture is not homogeneous during fermentation, (b) after cell mass has been produced in an amount that brings the dissolved oxygen concentration to zero or nearly zero during growth of the cells, increasing the feed rate of the carbon/energy source, and (c) determining if non-linearity occurs in the slope of dissolved oxygen concentration versus time or if oscillations in dissolved oxygen concentration are induced after the feed rate of the carbon/energy source is increased, wherein a propensity for sudden changes in dissolved oxygen concentration is indicated when either (i) a gradual slope is changed to a rapid slope in a graph of dissolved oxygen concentration vs. time or (ii) oscillations in dissolved oxygen concentration occur with increased carbon/energy source feed rate.

5,487,981

APPARATUS FOR AND METHOD OF DETECTING/IDENTIFYING MICROBIAL CONTAMINATION IN ULTRA-PURE WATER SYSTEMS

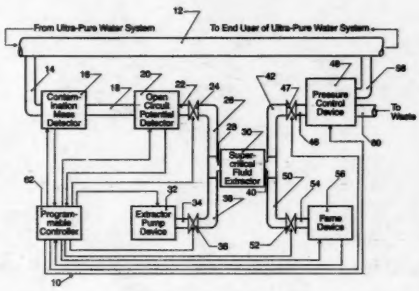
David E. Nivens, Knoxville; James Q. Chambers, Concord, and David C. White, Knoxville, all of Tenn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 30, 1993, Ser. No. 99,384

Int. Cl.[6] C12Q *1/24;* **C12M** *1/34*

U.S. Cl. 435—30 **13 Claims**

1. A method of on-line detection of the presence of microbial



contamination and quantitatively assessing the microbes in an associated ultra-pure water system comprising the steps of:

monitoring ultra-pure water flowing from said associated ultra-pure water system to detect the presence of microbial contamination;

detecting over time the growth of microbial biofilms which replicate said microbial contamination in said associated ultra-pure water system; and

assessing, in real time, quantitative measures of microbes present in said microbial biofilms indicated by the monitoring step and the detecting step.

5,487,982

METHOD OF OBTAINING IMMUNOGENIC PEPTIDES FROM CELLS EXPRESSING TEMPERATURE-SENSITIVE MUTANTS OF MAJOR HISTOCOMPATIBILITY COMPLEX MOLECULES

Russell D. Salter, Pittsburgh, Pa., assignor to University of Pittsburgh, Pittsburgh, Pa.

Filed May 21, 1993, Ser. No. 65,612

Int. Cl.[6] C07K *1/00;2/00;* **C12P** *21/00*

U.S. Cl. 435—69.1 **6 Claims**

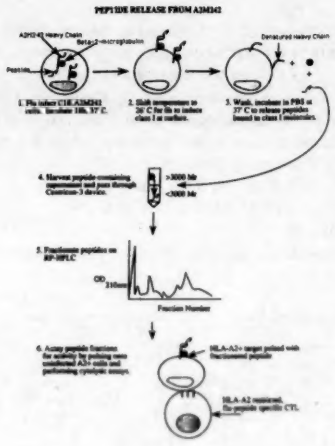
1. A method of obtaining peptides that are bound to class I major histocompatibility complex "MHC" molecules expressed on the cell surfaces of viable cells that have been transfected with genes for temperature-sensitive mutant class I molecules, said genes containing a mutation than codes for lysine instead of glutamine at position 242 of the α_3 domain of the class I heavy chain, comprising the steps of:

incubating said cells at about 37° C. in culture media;

incubating said cells at about 20°–30° C. to allow expression of MHC-peptide complexes on the surfaces of said cells;

incubating said cells at about 37° C. to cause dissociation of said peptides from the MHC-peptide complexes; and

recovering said peptides from the culture media.



5,487,984

PROCESSES FOR PRODUCING TUMOR NECROSIS FACTOR

Bernard Allet, Onex, and Eric H. Kawashima, Geneva, both of, Switzerland, assignors to Biogen, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 684,595, Dec. 21, 1984, abandoned, and Ser. No. 785,847, Oct. 9, 1985, abandoned. This application Dec. 20, 1985, Ser. No. 811,654

The portion of the term of this patent subsequent to Jan. 26, 2010, has been disclaimed.

Int. Cl.[6] **C12N** *15/00;15/19*

U.S. Cl. 435—69.5 **11 Claims**

1. A recombinant DNA molecule characterized by a DNA sequence operatively linked to an expression control sequence selected from T4 or λpL-T4, said DNA sequence being selected from the group consisting of:

(a) the DNA insert of p-mTNF-3 (DSM 3159);

(b) the DNA insert of p-hTNF-1 (DSM 3160);

(c) DNA sequences that hybridize to one or both of the foregoing DNA inserts and which code on expression for a tumor necrosis factor; and

(d) DNA sequences that code on expression for a polypeptide coded for on expression by any of the foregoing DNA inserts and sequences.

5,487,983

EXPRESSION SYSTEMS FOR MAKING SINGLE-CHAIN MONELLIN ANALOGS

Sung-Hou Kim, and Joong M. Cho, both of Moraga, Calif., assignors to The Regents of the University of California, Berkeley, and Lucky, Ltd., Emeryville, both of Calif.

Division of Ser. No. 502,257, Mar. 30, 1990, Pat. No. 5,264,558, which is a continuation-in-part of Ser. No. 465,585, Jan. 18, 1990, abandoned, which is a continuation of Ser. No. 117,124, Nov. 4, 1987, abandoned, and a continuation-in-part of Ser. No. 64,341, Jun. 19, 1987, abandoned, and a continuation-in-part of Ser. No. 64,343, Jun. 19, 1987, abandoned. This application Nov. 2, 1993, Ser. No. 146,326

Int. Cl.[6] **C12P** *21/06;* **C12N** *5/06;15/03;* **C07H** *21/04*

U.S. Cl. 435—69.1 **12 Claims**

1. A DNA molecule in isolated and purified form which encodes a protein useful as a sweetener of the formula B-C-A,

wherein B represents an amino acid sequence having at least 90% homology to the amino acid sequence at positions 1–46 of the B chain of native monellin as shown in FIG. 1 wherein corresponding nonidentical positions contain conservative substitutions;

C represents an amino acid sequence selected from the group consisting of

Tyr-Glu-Asn-Glu-Arg-Glu-Ile-Lys;

Tyr-Ala-Ser-Asp-Lys;

Glu-Asp-Asn-Arg-Glu-Asp-Ile-Lys;

Tyr-Lys-Thr-Arg-Glu-Asp-Ile-Lys;

Tyr-Glu-Arg-Glu-Ile-Lys;

Tyr-Glu-Asn-Ile-Lys;

Tyr-Glu-Ile-Lys;

Tyr-Tyr-Ala-Ser-Asp-Lys-Leu-Lys;

Tyr-Ala-Ser-Asp-Lys-Leu'

Tyr-Ser-Asp-Lys;

Glu-Asp-Tyr-Lys-Thr-Arg-Gly-Arg; and

Glu-Asp-Tyr-Thr-Arg, and

A represents an amino acid sequence having at least 90% homology to the amino acid sequence at positions 6–45 of the A chain of native monellin as shown in FIG. 1 wherein corresponding nonidentical positions contain conservative substitutions.

5,487,985

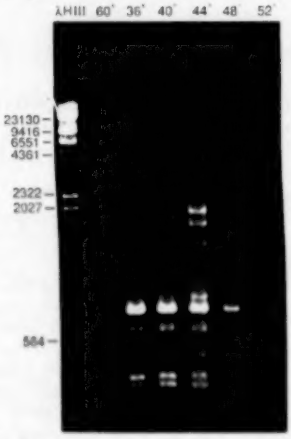
ARBITRARILY PRIMED POLYMERASE CHAIN REACTION METHOD FOR FINGERPRINTING GENOMES

Michael McClelland, Del Mar; John T. Welsh, Leucadia, and Joseph A. Sorge, Rancho Santa Fe, all of Calif., assignors to Stratagene, La Jolla, Calif.

Continuation-in-part of Ser. No. 633,095, Dec. 21, 1990, which is a continuation-in-part of Ser. No. 598,913, Oct. 15, 1990, abandoned. This application Oct. 9, 1992, Ser. No. 959,119

Int. Cl.[5] **C12P** *19/34;* **C12Q** *1/68*

U.S. Cl. 435—91.2 **14 Claims**



1. A method of generating a set of discrete DNA segments characteristic of a genome comprising:

(a) forming a polymerase chain reaction (PCR) admixture by combining, in a PCR buffer, genomic DNA and at least one first polynucleotide primer from about 10 to about 50 nucleotide bases in length;

(b) subjecting said PCR admixture of step (a) to at least one PCR thermocycle, each of said thermocycles comprising hybridization, primer extension and denaturation phases, said hybridization phase comprising hybridization conditions permitting the arbitrary priming of said genomic DNA, thereby producing said set of discrete DNA segments;

(c) contacting, in a PCR buffer, the set of discrete DNA amplification products formed in step (b) with at least one second polynucleotide primer from about 10 to 50 nucleotides in length, wherein said second primer or primers of this step each have nucleotide sequences that match the first primer or primers used in step (a) except that the second primer(s) each have one or more additional nucleotide bases at the 3' terminus of each second primer, wherein the additional nucleotide bases are additional with respect to the 3' terminus of the first primer or primers, to form a second PCR admixture; and

(d) subjecting said second PCR admixture to a plurality of PCR thermocycles, each of said thermocycles including hybridization, primer extension and denaturation phases, said hybridization phase comprising hybridization conditions that do not permit the formation of primer-template duplexes with a substantial degree of mismatching, thereby amplifying a subset of said discrete DNA segments.

5,487,986

METHOD FOR INCREASING PLASMID YIELD

Nick Wan, Newton, and Jason C. Goodrick, Cambridge, both of Mass., assignors to Genzyme Corporation, Cambridge, Mass.

Filed Mar. 10, 1994, Ser. No. 209,581

Int. Cl.[6] C12P *19/34;* **C12N** *1/20*

U.S. Cl. 435—91.1 **3 Claims**

1. An aqueous medium formulation for the plasmid production of a Escherichia coil host cell, the medium comprising about:

a) 30.0 grams of glucose;
b) 20.0 grams of yeast extract;
c) 10.0 grams ammonium chloride;
d) 1.5 grams of potassium phosphate;
e) 0.4 grams of magnesium sulfate;
f) 0.2 grams of potassium sulfate;
g) 10.0 grams of a meat digest;
h) 20.0 grams casein enzymatic hydrolysate;
i) 12.7 milligrams of ferrous sulfate;
j) 4.0 milligrams of calcium chloride;
k) 4.0 milligrams of sodium molybdate;
l) 20.0 milligrams of manganese sulfate;
m) 2.0 milligrams of cupric chloride;
n) 8.0 milligrams of cobalt chloride;
o) 1.0 milligrams of boric acid; and
p) 4.0 milligrams of zinc chloride,

per liter of the water component of the medium.

5,487,987

SYNTHESIS OF ADIPIC ACID FROM BIOMASS-DERIVED CARBON SOURCES

John W. Frost, and Karen M. Draths, both of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Sep. 16, 1993, Ser. No. 122,920

The portion of the term of this patent subsequent to Dec. 1, 2009, has been disclaimed.

Int. Cl.[6] C12P *7/44*

U.S. Cl. 435—142 **3 Claims**

1. A method for producing adipic acid, said method comprising the steps of culturing a bacterial cell, transformed with structural genes from *Klebsiella pneumoniae* which express the enzyme species 3-dehydroshikimate dehydratase and protocatechuate decarboxylase, and a structural gene from *Acinetobacter calcoaceticus* which expresses the enzyme species catechol 1,2-dioxygenase, in a medium containing a carbon source which is converted to 3-dehydroshikimate by the enzymes in the common pathway of aromatic amino acid biosynthesis of said cell, to produce cis, cis-muconic acid at a rate greater than 0.35 millimoles/liter/hour, by the biocatalytic conversion of 3-dehydroshikimate, and reducing the cis, cis-muconic acid to produce adipic acid.

5,487,988

PREPARATION OF PERILLYL COMPOUNDS USING *BACILLUS STEAROTHERMOPHILUS*

Hae C. Chang, Taejeon, Rep. of Korea, and Patrick J. Oriel, Midland, Mich., assignors to Board of Trustees Operating Michigan State University, E. Lansing, Mich.

Filed Aug. 15, 1994, Ser. No. 290,469

Int. Cl.[6] C12P *7/24;7/02;* **C12N** *1/20*

U.S. Cl. 435—147 **10 Claims**

1. A process for producing perillyl compounds which comprises:

(a) providing a culture medium containing cells of a strain of *Bacillus stearothermophilus* having all the identifying characteristics of *Bacillus stearothermophilus* ATCC 55596;

(b) incubating the cells in the culture medium with limonene to produce isolatable amounts of the perillyl compounds in the culture medium; and

(c) recovering the perillyl compounds from the culture medium.

5,487,989

ETHANOL PRODUCTION BY RECOMBINANT HOSTS

David E. Fowler; Philip G. Horton, and Arie Ben-Bassat, all of Gainesville, Fla., assignors to Bioenergy International, L.C., Gainesville, Fla.

Continuation-in-part of Ser. No. 846,344, Mar. 6, 1992, which is a continuation-in-part of Ser. No. 670,821, Mar. 18, 1991, abandoned, and a continuation-in-part of Ser. No. 624,277, Dec. 7, 1990, abandoned, each 352,062, May 15, 1989, Pat. No. 5,000,000which is a continuation-in-part of Ser. No. 239,099, Aug. 31, 1988, abandoned. This application Sep. 17, 1992, Ser. No. 946,290

Int. Cl.[6] C12N *1/21;9/42;* **C12P** *7/10;7/14*

U.S. Cl. 435—165 **39 Claims**

1. A method for producing ethanol from cellulose-containing biomass, comprising the steps of:

A. contacting, in a first reaction vessel, said biomass with a polysaccharase such that cellulose in said biomass is broken down into simpler oligosaccharides and/or monosaccharides, wherein said contacting is carried out at a temperature of from about 40° C. to about 60° C. and a pH of from about 4.5 to about 5.0;

B. producing from said first reaction vessel a sugar solution comprising said simpler oligosaccharides and/or monosaccharides;

C. introducing said sugar solution into a fermentor which comprises gram-negative enteric recombinant host microorganisms capable of fermenting said simpler oligosaccharides and/or monosaccharides into ethanol; and

D. fermenting said simpler oligosaccharides and/or monosaccharides into ethanol at a temperature of from about 30° C. to about 35° C. and a pH of about 6.0,

wherein said microorganism is capable of fermenting monosaccharides into ethanol, and comprises a recombinant host, other than *Escherichia coli,* comprising a first heterologous DNA coding for alcohol dehydrogenase and pyruvate decarboxylase, wherein said heterologous DNA is from *Zymomonas mobilis* and wherein said host expresses said heterologous DNA at a sufficient functional level so as to facilitate the production of ethanol as the primary fermentation product by said host,

wherein said host also produces a polysaccharase, and said host further comprises a second heterologous DNA segment, the expression product of which is said polysaccharase.

5,487,990

GLUCOSE-REGULATED PROMOTER OF YEAST ACETYL-COA HYDROLASE

John A. Smith, Scotch Plains, N.J.; Fang-Jen S. Lee, and Lee-Wen Lin, both of North Bethesda, Md., assignors to The General Hospital Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 480,452, Feb. 15, 1990, abandoned, which is a continuation-in-part of Ser. No. 213,943, Jul. 1, 1988, abandoned, and a continuation-in-part of Ser. No. 297,083, Jan. 13, 1989, abandoned. This application Jul. 30, 1992, Ser. No. 921,796

Int. Cl.[5] C12N *1/19;15/81;15/11*

U.S. Cl. 435—172.3 **16 Claims**

12. A method of regulating the expression of a protein in a controlled manner, said method comprising:

making a recombinant DNA construct comprised of a glucose-repressible promoter operably joined in a 5' to 3' direction of transcription to a DNA encoding said protein, wherein said glucose-repressible promoter comprises SEQ ID NO: 11 flanked on at least one side by DNA that is not naturally associated with SEQ ID NO: 11;

transforming said recombinant DNA construct into a yeast host cell;

(c) growing said yeast host cell in glucose-containing media sufficient to depress activity of SEQ ID NO: 11;

(d) transferring said yeast host cells to a glucose-free medium; and

(e) expressing said protein under the control of said glucose-repressible promoter.

5,487,991

PROCESS FOR THE PRODUCTION OF BIOLOGICALLY ACTIVE PEPTIDE VIA THE EXPRESSION OF MODIFIED STORAGE SEED PROTEIN GENES IN TRANSGENIC PLANTS

Joël S. Vandekerckhove, Loppem, Belgium; Enno Krebbers, Alhambra, Calif.; John Botterman, Zevergem-de Pinte, and Jan Leemans, Deurle, both of, Belgium, assignors to Plant Genetic Systems N.V., Brussels, Belgium

Continuation of Ser. No. 363,898, Aug. 2, 1989, abandoned. This application Apr. 14, 1993, Ser. No. 45,773

Claims priority, application United Kingdom, Jan. 20, 1987, 87402348

Int. Cl.[5] C12N *15/62;15/29;15/82;* **A01H** *5/00*

U.S. Cl. 435—172.3 **22 Claims**

1. A process for producing a polypeptide, which process comprises the steps of:

(a) cultivating a seed-forming plant, said plant comprising in its genome a chimeric DNA construct encoding a precursor of a modified 2S albumin wherein said chimeric DNA construct comprises:

(i) a first DNA sequence encoding a precursor of a 2S albumin which is modified in the hypervariable region encoding the region between a fourth cysteine residue and a fifth cysteine residue of a large subunit of said 2S albumin by replacing all or part of said hypervariable region with a heterologous second DNA sequence encoding said polypeptide, wherein the ends of said second DNA sequence are linked to one or more codons encoding one or more amino acid residues to define first selectively clearable border sites; and

(ii) a seed specific promoter; wherein said modified 2S albumin is expressed and accumulated in the seeds of said plant;

(b) isolating from the seeds of said plant said modified 2S albumin;

(c) cleaving said modified 2S albumin at said cleavable border sites; and

(d) recovering said polypeptide.

5,487,992

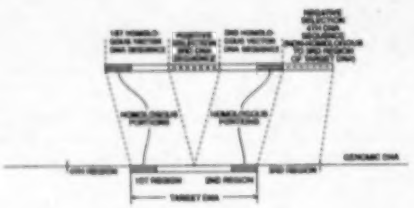
CELLS AND NON-HUMAN ORGANISMS CONTAINING PREDETERMINED GENOMIC MODIFICATIONS AND POSITIVE-NEGATIVE SELECTION METHODS AND VECTORS FOR MAKING SAME

Mario R. Capecchi, and Kirk R. Thomas, both of Salt Lake City, Utah, assignors to University of Utah Research Foundation, Salt Lake City, Utah

Division of Ser. No. 14,083, Feb. 4, 1993, which is a continuation of Ser. No. 397,707, Aug. 22, 1989, abandoned. This application Jun. 28, 1993, Ser. No. 84,741

Int. Cl.[6] A01K *67/00;* **C12N** *15/63;15/65;15/90*

U.S. Cl. 435—172.3 **1 Claim**



1. A method of producing a transgenic mouse having a genome comprising a modification of a target DNA sequence, said method comprising:

(a) transforming a population of mouse embryonic stem cells with a PNS vector;

(b) identifying a mouse embryonic stem cell having said genome by selecting :for cells containing said positive selection marker and against cells containing said negative selection marker;

(c) inserting said cell into a mouse embryo; and

(d) propagating a mouse from said embryo; and

(e) breeding the mouse to produce a transgenic mouse; wherein said PNS vector comprises:

(1) a first homologous vector DNA sequence capable of homologous recombination with a first region of said target DNA sequence,

(2) a positive selection marker DNA sequence capable of conferring a positive selection characteristic in said cells,

(3) a second homologous vector DNA sequence capable of homologous recombination with a second region of said target DNA sequence, and

(4) a negative selection marker DNA sequence, capable of conferring a negative selection characteristic in said cells, but substantially incapable of homologous recombination with said target DNA sequence,

wherein the spatial order of said sequences in said PNS vector is: said first homologous vector DNA sequence, said positive selection marker DNA sequence, said second homologous vector DNA sequence and said negative selection marker DNA sequence, as shown in FIG. 1,

wherein the 5'–3' orientation of said first homologous vector sequence relative to said second homologous vector sequence is the same as the 5'–3' orientation of said first region relative to said second region of said target sequence.

5,487,993

DIRECT CLONING OF PCR AMPLIFIED NUCLEIC ACIDS

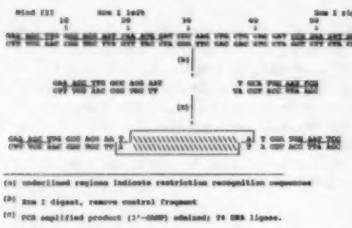
Corinna Herrnstadt, San Diego; Joseph M. Fernandez, Carlsbad, both of Calif.; Lloyd Smith, and David A. Mead, both of Madison, Wis., assignors to Invitrogen Corporation, San Diego, Calif., and Chimer, Milwaukee, Wis.

Continuation of Ser. No. 950,742, Sep. 24, 1992, abandoned, which is a continuation of Ser. No. 589,817, Sep. 27, 1990, abandoned. This application Sep. 9, 1993, Ser. No. 119,313

Int. Cl.[6] C12P *19/34*

U.S. Cl. 435—172.3 **20 Claims**

1. A method of direct cloning of polymerase chain reaction



amplified nucleic acids containing a target DNA segment, which method comprises:

(a) subjecting said target DNA segment to polymerase chain reaction amplification to produce a plurality of double-stranded nucleic acids including said DNA segment, each of said nucleic acids having a single, overhanging dAMP residue located at each 3' terminus;

(b) forming a ligation reaction mixture by admixing the plurality of double-stranded nucleic acids with linear double-stranded DNA molecules, said linear DNA molecules each having a single, overhanging (unpaired) dTMP residue at each 3' terminus;

(c) maintaining said mixture under predetermined reaction conditions for a time period sufficient to effect ligation of the nucleic acids to the linear DNA molecules to produce recombinant DNA nucleic acid molecules; and

(d) transforming a compatible host cell line with said recombinant DNA molecules.

5,487,994

INSERTION AND DELETION MUTANTS OF FOKI RESTRICTION ENDONUCLEASE

Srinivasan Chandrasegaran, Baltimore, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 126,564, Sep. 27, 1993, which is a continuation-in-part of Ser. No. 17,493, Feb. 12, 1993, abandoned, which is a continuation-in-part of Ser. No. 862,831, Apr. 3, 1992, Pat. No. 5,356,802. This application Nov. 23, 1994, Ser. No. 346,293

Int. Cl.[6] C12N *9/22*

U.S. Cl. 435—199 **10 Claims**

1. A mutant *FokI* endonuclease having an N-terminal DNA recognition domain and a C-terminal DNA cleavage domain,

wherein said DNA recognition domain binds to a recognition site on a DNA substrate and said cleavage domain cuts at a cleavage site on said DNA substrate,

wherein said recognition site is located at a distance from said cleavage site within said DNA substrate and

wherein the distance between said recognition site and said cleavage site is shifted one base pair away from said recognition site as compared to said distance between said recognition site and said cleavage site recognized by wild-type enzyme.

5,487,995

Patent Not Issued For This Number

5,487,996

GENE CODING FOR ESTERASE AND NOVEL MICROORGANISM CONTAINING SAID GENE

Takeji Shibatani, Kobe; Saburo Komatsubara, Kawaguchi; Kenji Omori, Takatsuki, and Hiroyuki Akatsuka, Moriguchi, all of, Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Continuation of Ser. No. 980,516, Nov. 25, 1992, abandoned. This application Jul. 11, 1994, Ser. No. 272,875

Claims priority, application Japan, Nov. 25, 1991, 3-355440; Apr. 13, 1992, 4-137502

Int. Cl.[6] C12N *1/20;1/21*

U.S. Cl. 435—252.1 **3 Claims**

1. A transformant *Serratia marcescens* which contains a recombinant plasmid comprising a plasmid containing a gene encoding an esterase, wherein said gene has the DNA sequence as shown in SEQ. ID NO: 1 or in SEQ. ID NO: 2.

5,487,997

PIPETTE TIP MOUNTING AND TRANSFER APPARATUS AND METHOD

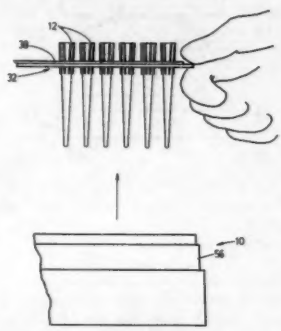
Philip E. Stolp, Kenwood, Calif., assignor to Point Plastics Incorporated, Petaluma, Calif.

Filed Feb. 15, 1994, Ser. No. 196,967

Int. Cl.[6] B01L *3/02*

U.S. Cl. 436—54 **30 Claims**

16. A pipette tip assembly, comprising:



at least one longitudinally extending pipette tip, the tip having an exterior surface defining a tapered portion, the tapered portion comprising a tapered abutment member which is inwardly tapered from an upper plane towards a lower plane and has a lower end disposed adjacent to the lower plane, wherein the upper and lower planes are transverse to a longitudinal axis of the tip when the tip is vertically oriented and wherein the lower plane is disposed above a lower end of the tip; and,

a tip holder, having at least one tapered holder aperture in which the tip is removably disposed, the tip holder disposed between the upper plane and the lower end of the abutment member, the tip holder selectively movable from an upper position relative to the tip, to a lower position adjacent to the lower end of the abutment member, when in the upper position, the tip holder held above the lower end of the abutment member and rigidly maintaining the tip from wobble in the tip holder until selectively moved from the upper position, when in the lower position, the tip being removable from the tip holder.

5,487,998

TRAPPING OF AFLATOXINS AND PHYTOESTROGENS

Pesi P. Umrigar, Kenner, and Shia S. Kuan, Metarie, both of La., assignors to The United States of America as represented by the Secreatry of the Department of Health and Human Services, Washington, D.C.

Filed Jan. 6, 1993, Ser. No. 1,573

Int. Cl.[6] G01N *33/00*

U.S. Cl. 436—93 **16 Claims**

1. A method of removing aflatoxins from a sample, which method comprises:

(a) preparing the sample containing said aflatoxins,

(b) contacting said sample with a compound selected from the group consisting of halo, azido, and amino cyclodextrin/epichlorohydrin copolymers under conditions suitable to effect entrapment of said aflatoxins by said compound, and

(c) removing the entrapped aflatoxins from said sample.

5,487,999

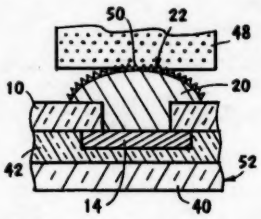
METHOD FOR FABRICATING A PENETRATION LIMITED CONTACT HAVING A ROUGH TEXTURED SURFACE

Warren M. Farnworth, Nampa, Id., assignor to Micron Technology, Inc., Boise, Id.

Continuation-in-part of Ser. No. 73,005, Jun. 7, 1993, Pat. No. 5,408,190, which is a continuation-in-part of Ser. No. 709,858, Jun. 4, 1991, abandoned, and Ser. No. 788,065, Nov. 5, 1991, Pat. No. 5,440,240, and Ser. No. 981,956, Nov. 24, 1992. This application Nov. 22, 1994, Ser. No. 343,730

Int. Cl.[6] H01L *21/00*

U.S. Cl. 437—7 **37 Claims**



1. A method for forming a contact structure for forming an electrical connection with a contact location on a semiconductor die, said method comprising:

forming a compliant substrate;

mounting a raised contact on the substrate;

forming a rough textured surface on the raised contact, said rough textured surface including raised asperities adapted to penetrate said contact location to a penetration depth; and

establishing an electrical path on the substrate to the raised contact.

5,488,000

METHOD OF FABRICATING A THIN FILM TRANSISTOR USING A NICKEL SILICIDE LAYER TO PROMOTE CRYSTALLIZATION OF THE AMORPHOUS SILICON LAYER

Hongyong Zhang, and Satoshi Teramoto, both of Kanagawa, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

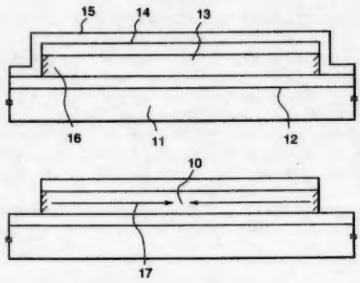
Filed Jun. 14, 1994, Ser. No. 260,413

Claims priority, application Japan, Jun. 22, 1993, 5-174736; Jun. 25, 1993, 5-180754

Int. Cl.[6] H01L *21/00;21/336*

U.S. Cl. 437—21 **16 Claims**

1. A method of fabricating a semiconductor device comprising the steps of:



forming a non-single crystal semiconductor film on a substrate;

forming an insulating film on the semiconductor film;

patterning the semiconductor film and the insulating

forming a film containing a metal element for promoting crystallization of the semiconductor film, on the patterned insulating film and in contact with a side of the patterned semiconductor film; and

starting the crystallization from the side of the patterned semiconductor film.

5,488,001

MANUFACTURE OF ELECTRONIC DEVICES COMPRISING THIN-FILM TRANSISTORS USING AN ION IMPLANTATION MASK HAVING BEVELLED EDGES

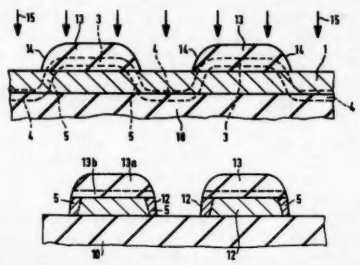
Stanley D. Brotherton, Forest Row, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 28, 1994, Ser. No. 281,967

Claims priority, application United Kingdom, Jul. 30, 1993, 9315798

Int. Cl.[6] H01L *21/336;21/84*

U.S. Cl. 437—21 **11 Claims**



1. A method of manufacturing an electronic device comprising thin-film transistors formed on a substrate by steps which include: (a) depositing a disordered material on the substrate to provide a semiconductor film in which channel regions of the transistors are to be accommodated, charge-trapping states being present in the semiconductor film, (b) providing a masking pattern on the semiconductor film to mask areas where the thin-film transistors are to be formed, (c) etching away the unmasked areas of the film from the substrate to leave semiconductor film bodies for the transistors, and (d) providing the semiconductor film bodies with electrodes forming a source, a drain and an insulated gate of each transistor, the transistor current flow through the channel region between the source and drain being by charge carriers of a first conductivity type under the control of the insulated gate in operation of the transistor, which method is characterised in that the masking pattern is provided with bevelled edge portions which are present when an implantation step (e) is carried out to implant ions of a second conductivity type dopant into the semiconductor film material, the thickness of the masking pattern in step (c) being sufficiently large as to mask the underlying semiconductor film against

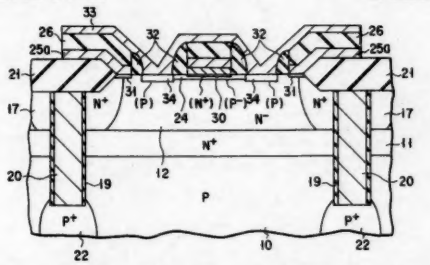
implantation of the ions except below the bevelled edge portions where the ions are implanted through the bevelled edge portions to form a dopant stripe across the thickness of the semiconductor film material, which dopant stripe is at least partly retained in the thin-film transistors as a dopant edge to the channel regions for reducing leakage currents along the edges of the channel region in operation of the transistors.

5,488,002

METHOD FOR MANUFACTURING SELF-ALIGNED BIPOLAR TRANSISTORS USING DOUBLE DIFFUSION

Koji Kimura, Chigasaki, and Shin-ichi Taka, Kitakyushu, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 8, 1994, Ser. No. 302,199
Claims priority, application Japan, Sep. 10, 1993, 5-226117
Int. Cl.[6] H01L *21/265*
U.S. Cl. 437—31 **40 Claims**



1. A method for manufacturing bipolar transistors, comprising:

a first step of depositing a first polycrystalline semiconductor film containing second impurities of a second conductivity type over a semiconductor substrate containing first impurities of a first conductivity type;

a second step of selectively removing the first polycrystalline semiconductor film such that the first polycrystalline semiconductor film remains in a region where a first semiconductor layer is formed;

a third step of forming a first semiconductor layer of the second conductivity type by diffusing the second impurities from the remaining portion of the first polysilicon semiconductor film into the semiconductor substrate;

a fourth step of depositing a second polycrystalline semiconductor film containing third impurities of the first conductivity type over a resultant structure;

a fifth step of depositing a first insulation film over a resultant structure;

a sixth step of selectively removing a laminated film made up of the first insulating film, the second polycrystalline semiconductor film and the first polycrystalline semiconductor film, such that the laminated film remains in a region where a second semiconductor layer is formed;

a seventh step of forming a second semiconductor layer of the first conductivity type by diffusing the third impurities from the second polycrystalline semiconductor film into the first semiconductor layer through the first polycrystalline semiconductor film;

an eight step of forming a second insulation film on a side wall of the laminated film made up of the first insulation film, second polycrystalline semiconductor film and first polycrystalline semiconductor film;

a ninth step of depositing a third polycrystalline semiconductor film containing the second impurities of the second conductivity type over a resultant structure; and

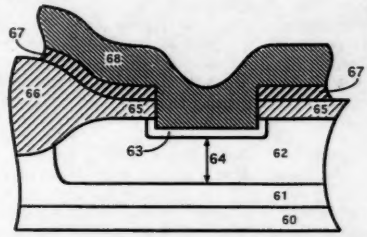
a tenth step of forming a third semiconductor layer of the second conductivity type by diffusing the second impurities from the third polycrystalline semiconductor film into the semiconductor substrate, said third semiconductor layer being electrically connected to the first semiconductor layer.

5,488,003

METHOD OF MAKING EMITTER TRENCH BICMOS USING INTEGRATED DUAL LAYER EMITTER MASK

Stephen Chambers; Brian J. Brown; Chan-Hong Chern, all of Portland; Robert Chau, Beaverton, and Leopoldo D. Yau, Portland, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Mar. 31, 1993, Ser. No. 40,673
Int. Cl.[6] H01L *21/265*
U.S. Cl. 437—31 **15 Claims**



1. A method of maintaining an approximately constant, relative distance between a bottom of a trench etched through a first layer and into a semiconductor substrate and a diffusion depth of a doped region of said semiconductor substrate which has been implanted through said first layer, said distance between said trench bottom and said diffusion depth being constant regardless of variations in thickness of said first layer, said method comprising the steps of:

(a) forming said first layer above said semiconductor substrate;

(b) implanting a dopant material through said first layer and into said semiconductor substrate to create said doped region within said semiconductor substrate; and

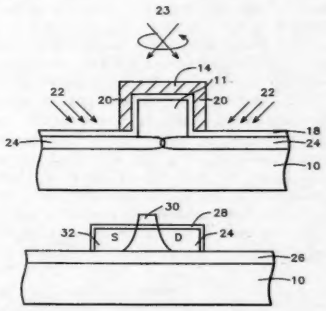
(c) forming said trench by etching through said first layer and said semiconductor substrate using an etchant which etches said first layer and said semiconductor substrate with an etch selectivity having an etch ratio of said first layer to said semiconductor substrate approximately equal to a ratio of projected implanted ranges of said dopant material of said first layer to said semiconductor substrate.

5,488,004

SOI BY LARGE ANGLE OXYGEN IMPLANT

Ming-Tzong Yang, Hsin Chu, Taiwan, Prov. of China, assignor to United Microelectronic Corporation, Hsinchu, Taiwan, Prov. of China

Filed Sep. 23, 1994, Ser. No. 311,261
Int. Cl.[6] H01L *21/76;21/265*
U.S. Cl. 437—35 **26 Claims**



1. The method of forming a silicon-on-insulator device in the manufacture of an integrated circuit comprising:

forming a first silicon oxide layer on the surface of a semiconductor substrate;

depositing a first implant-stop layer over said silicon oxide layer and patterning said first implant-stop layer;
etching into said semiconductor substrate where said substrate is not covered by said patterned implant-stop layer to provide a silicon pillar underlying said patterned implant-stop layer;
forming a second silicon oxide layer on all exposed surfaces of said silicon pillar and said silicon semiconductor substrate;
depositing a second implant-stop layer over all surfaces of said substrate;
anisotropically etching said second implant-stop layer to form spacers on the sidewalls of said silicon pillar;
thereafter performing a single oxygen ion implantation using a single energy at a tilt angle to form implanted regions within said semiconductor substrate wherein said implanted regions are formed directly underneath said second silicon oxide layer overlying said semiconductor substrate and wherein said implanted regions extend and intersect under said silicon pillar;
removing said first implant-stop layer and said spacers;
annealing said semiconductor substrate wherein said implanted regions are transformed into silicon dioxide regions; and
removing said first and second silicon oxide layers to complete formation of said silicon-on-insulator device in the manufacture of an integrated circuit.

5,488,005

PROCESS FOR MANUFACTURING AN OFFSET GATE STRUCTURE THIN FILM TRANSISTOR

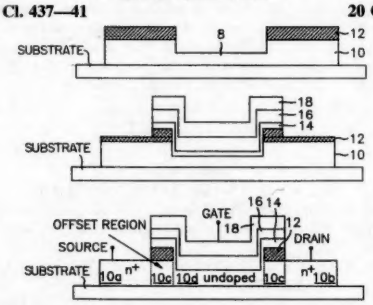
Min-Ku Han, and Byung-Hyuk Min, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed May 5, 1995, Ser. No. 435,324

Claims priority, application Rep. of Korea, May 6, 1994, 9959/1994

Int. Cl.[6] H01L *21/86*

U.S. Cl. 437—41 **20 Claims**



1. A process for manufacturing an offset gate structure thin film transistor, comprising the steps of:
forming a first semiconductor layer comprised of a first semiconductor material on a major surface of a substrate;
forming a buffer layer on said first semiconductor layer;
etching away a first region of said buffer layer and etching a corresponding region of said first semiconductor layer to a predetermined depth, to thereby form a recess and an underlying thin channel region in said first semiconductor layer, said thin channel region having a thickness less than that of the remainder of said first semiconductor layer;
forming a second semiconductor layer comprised of a second semiconductor material on said buffer layer and exposed portions of said said first semiconductor layer defining said recess;
forming a gate insulating layer on said second semiconductor layer;
forming a conductive layer on said gate insulating layer;
etching said second semiconductor layer, said gate insulating layer, and said conductive layer so as to form a gate electrode structure overlying said thin channel region of said first semiconductor layer and offset resistance regions of said first semiconductor layer disposed on opposite sides of said thin channel region; and,
ion-implanting impurities into said first semiconductor layer through exposed portions of said buffer layer disposed on opposite sides of said gate electrode structure, to thereby form source and drain regions on opposite sides of said offset resistance regions of said first semiconductor layer.

5,488,006

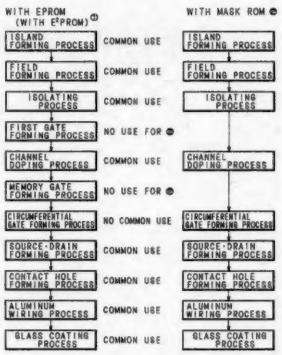
ONE-CHIP MICROCOMPUTER MANUFACTURING METHOD

Shozo Shirota, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 585,539, Sep. 20, 1990, abandoned. This application Jan. 28, 1993, Ser. No. 10,501

Int. Cl.[6] H01L *21/266;21/8247*

U.S. Cl. 437—43 **1 Claim**



1. A method of manufacturing a mask ROM, said method comprising the steps of:
producing EPROM structures on a first semiconductor substrate using a set of EPROM-specific photomasks, said set of EPROM-specific photomasks including an EPROM-specific channel doping mask and wherein said EPROM structures include EPROM-specific memory cells using transistors having a first current-voltage characteristic and including a corresponding EPROM cell sense amplifier coupled to said EPROM-specific memory cells, said corresponding EPROM cell sense amplifier adapted for operation with said EPROM-specific memory cells; and thereafter
forming islands, forming field regions, and isolating a plurality of areas on a second semiconductor substrate by employing a first subset of said set of EPROM-specific photomasks to produce mask ROM-specific memory cells using transistors having a second current-voltage characteristic different from said first current-voltage characteristic and producing a corresponding mask ROM cell sense amplifier coupled to said mask ROM-specific memory cells wherein said corresponding mask ROM cell sense amplifier includes a current detecting transistor adapted for operation with said EPROM-specific memory cells;
doping a channel in a plurality of regions of said second semiconductor substrate by employing said EPROM-specific channel doping mask; and
forming a circumferential gate area and adjusting a geometry of a gate of said current detecting transistor by use of a mask ROM-specific photomask to achieve a particular electrical current-voltage characteristic for said corresponding mask ROM cell sense amplifier adapted for operation with said mask ROM-specific memory cells; and forming sources and drains, forming contact holes, forming aluminum interconnections, and forming glass coating by employing a second subset of said set of EPROM-specific photomasks.

5,488,007
METHOD OF MANUFACTURE OF A SEMICONDUCTOR DEVICE

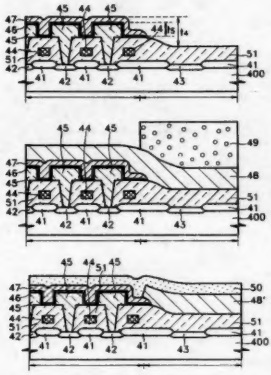
Kyeong-tae Kim, Seoul; Yun-seung Shin, Kyungnki-do; Younghun Park; Won-mo Park, both of Kyungki-do, and Ji-hong Ahn, Seoul, all of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 16, 1993, Ser. No. 42,490

Claims priority, application Rep. of Korea, Apr. 16, 1992, 92-6393; Nov. 10, 1992, 92-20972

Int. Cl.[6] H01L *21/00*

U.S. Cl. 437—47 **10 Claims**



1. A method for manufacturing a semiconductor device having a closed step portion and at least one global step portion, a step difference being defined by the respective surfaces of said closed step portion and said global step portion, comprising the steps of:

forming a first insulating layer, said first insulating layer comprising an inorganic material, on said closed step portion and said global step portion;

forming a photoresist pattern for forming a dummy pattern on said global step portion through a photolithography method;

etching said first insulating layer to form said dummy pattern, using said photoresist pattern as an etching mask;

removing said photoresist pattern;

forming a second insulating layer, said second insulating layer comprising an inorganic material, on said closed step portion and said global step portion.

5,488,008
METHOD OF FABRICATING A STACKED CAPACITOR MEMORY CELL IN A SEMICONDUCTOR MEMORY DEVICE

Koichiro Kawamura, Tokyo, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 131,609, Oct. 5, 1993, abandoned. This application Feb. 2, 1995, Ser. No. 384,465

Claims priority, application Japan, Jan. 9, 1992, 4-297702

Int. Cl.[6] H01L *21/70;27/00*

U.S. Cl. 437—52 **4 Claims**

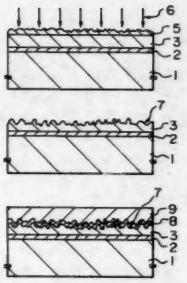
1. A method of manufacturing a capacitor, in a semiconductor memory device having memory cells, each having a transistor and a capacitor, comprising the steps of:

depositing an insulating film on a semiconductor substrate;

forming on said insulating film a polycrystalline silicon film serving as a lower electrode of said capacitor;

depositing an oxide film having an uneven surface on said polycrystalline silicon film by exposing said polycrystalline silicon film to an oxidizing atmosphere including N-type impurities; and

etching anisotropically said polycrystalline silicon film and said oxide film until said oxide film is substantially completely removed, said uneven surface of said oxide layer producing



an uneven etch rate of said polycrystalline silicon film and a magnification of said uneven surface of said oxide film in said polycrystalline silicon film.

5,488,009
POST-TITANIUM NITRIDE MASK ROM PROGRAMMING METHOD

Chen-Chiu Hsue, Hsin chu; Yi-Chung Shen, Taichung; Shing-Ren Sheu, Tao-Yuan, and Chen-Hui Chung, Hsin-Chu, all of, Taiwan, Prov. of China, assignors to United Microelectronics Corporation, Hsinchu, Taiwan, Prov. of China

Filed Nov. 23, 1994, Ser. No. 344,004

Int. Cl.[6] H01L *21/8246*

U.S. Cl. 437—52 **20 Claims**

1. A method of manufacturing a ROM semiconductor device which comprises the steps in the sequential order of:

taking a semiconductor substrate with an array of parallel burled bit lines integral therewith, laid buried bit lines being oriented in a first direction, a gate oxide lays: above said substrate and said buried bit lines, and word lines formed above said gate oxide layer,

forming a dielectric layer over laid word lines and said gate oxide layer,

forming a contact hole in said dielectric layer,

forming a blanket titanium nitride layer over said device extending into said contact hole,

forming a ROM code cask over said device, said ROM code mask having a ROR code opening therethrough, said opening being centered between a pair of said bit lines,

performing etching of said titanium nitride layer through said ROM code mask,

said titanium nitride layer having a stop height over said dielectric layer,

ion implanting a code implant dopant through said ROM code opening down into a doped region in said substrate below said ROM code opening,

removing said ROM code mask,

performing a rapid thermal annealing step,

applying a blanket layer of metal to said device including said contact hole, and patterning said metal.

5,488,010
METHOD OF FABRICATING SIDEWALL CHARGE-COUPLED DEVICE WITH TRENCH ISOLATION

Hon-Sum P. Wong, Peekskill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

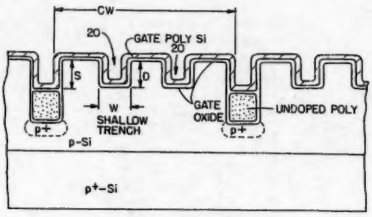
Division of Ser. No. 57,425, May 5, 1993, Pat. No. 5,334,868, which is a continuation of Ser. No. 652,959, Feb. 8, 1991, abandoned. This application May 10, 1994, Ser. No. 241,137

Int. Cl.[6] H01L *21/70;27/148*

U.S. Cl. 437—53 **4 Claims**

1. A method of fabricating a sidewall charge-coupled device with trench isolation comprising the steps of:

providing a substrate of semiconductor material;



defining a plurality of isolation trenches in a surface of said substrate to form columns of charge coupled cells between the isolation trenches, said plurality of isolation trenches being formed to increase the surface areas of the charge coupled cells therebetween and facilitate transport of charges along the cell sidewalls;

disposing a plurality of alternating first and second sets of substantially parallel surface electrodes arranged in an overlapping electrode configuration over substantially the entire upper surface of the substrate extending substantially perpendicular to the isolation trenches, said plurality of alternating first and second sets of surface electrodes producing, by an applied electric field, an induced potential well in the substrate beneath each of the plurality of alternating first and second sets of surface electrodes, such that substantially the entire upper surface of the substrate and the sidewalls in common with the upper portions of the sidewalls of the isolation trenches produce photon to electron conversion in response to incident light; and

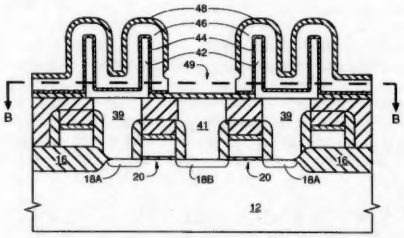
disposing a plurality of shallow trenches, shallow relative to the deeper isolation trenches, under the surface electrodes in each column of cells defined between adjacent isolation trenches to increase the charge carrying surface area and provide better gate control.

5,488,011

METHOD OF FORMING CONTACT AREAS BETWEEN VERTICAL CONDUCTORS

Thomas A. Figura, and Kirk D. Prall, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Nov. 8, 1994, Ser. No. 336,426
Int. Cl.[6] H01L *21/8242*
U.S. Cl. 437—60 **18 Claims**



1. A method of making an integrated circuit device, comprising:

a. forming first and second structures each having a vertical sidewall;

b. forming a first layer of material conforming to, and extending between the vertical sidewalls;

c. forming a mask layer conforming to the first layer, wherein the mask layer has a horizontal region between the vertical sidewalls and vertical regions along the vertical sidewalls;

d. patterning and etching the mask layer to remove the horizontal region of the mask layer, thereby exposing portions of the first layer between the vertical sidewalls, while retaining at least a portion of each vertical region of the mask layer; and

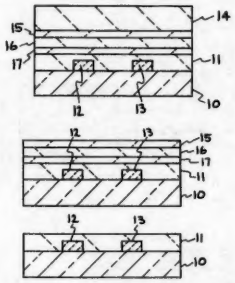
e. using the remaining mask layer as an etch mask, etching away the exposed portions of the first layer.

5,488,012

SILICON ON INSULATOR WITH ACTIVE BURIED REGIONS

Anthony M. McCarthy, Menlo Park, Calif., assignor to Regents of the University of California, Oakland, Calif.

Filed Oct. 18, 1993, Ser. No. 137,412
Int. Cl.[6] H01L *21/76*
U.S. Cl. 437—62 **19 Claims**



1. A method for forming at least one buried region in a silicon-on-insulator member, comprising:

depositing at least one layer of silicon on a substrate;

doping at least a selected area of the layer of silicon to form at least one buried region in an outer surface region of the silicon layer;

bonding the silicon layer to an insulator substrate such that the at least one buried region is directly contiguous with a surface of the insulator substrate; and

totally removing the substrate on which the layer of silicon was deposited;

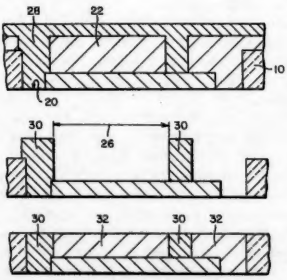
whereby the thus formed buried region is buried beneath an opposite surface of the silicon layer.

5,488,013

METHOD OF FORMING TRANSVERSE DIFFUSION BARRIER INTERCONNECT STRUCTURE

Robert M. Geffken, Burlington, and Matthew J. Rutten, Milton, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 169,787, Dec. 20, 1993. This application Apr. 26, 1995, Ser. No. 428,995
Int. Cl.[6] H01L *21/28*
U.S. Cl. 437—187 **5 Claims**



1. A method of forming an interconnect line in an insulator layer of a semiconductor structure, said method comprising:

forming an insulator layer;

forming a trench in said insulator layer, said trench having a first depth within said insulator layer for an interconnect line and a second depth through said insulator layer for contact of said interconnect line to a layer underlying said insulator layer;

forming a pattern of sections of material transversely and spaced apart within said trench;

forming a layer of diffusion barrier material over said pattern and within said trench;

removing a portion of said diffusion barrier material so as to form a plurality of transverse spaced apart vertical sections of diffusion barrier material within said trench;

removing said pattern of material, so as to leave a plurality of transverse diffusion barriers spaced apart within said trench; and

forming a layer of metallization within remaining portions of said trench, said metallization and said plurality of transverse diffusion barriers thereby forming an interconnect line within said insulator layer wherein said interconnect line has a plurality of transverse diffusion barriers spaced apart therein.

5,488,014

INTERCONNECTION STRUCTURE OF SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE AND MANUFACTURING METHOD THERERFOR

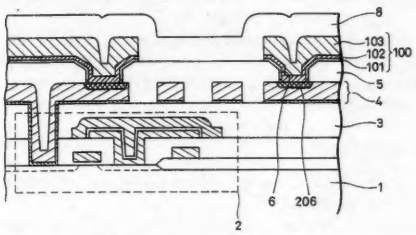
Shigeru Harada; Junichi Arima, and Noriaki Fujiki, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 104,520, Aug. 10, 1993, Pat. No. 5,313,101, which is a continuation of Ser. No. 748,216, Aug. 22, 1991. This application Mar. 15, 1994, Ser. No. 213,417

Claims priority, application Japan, Aug. 28, 1990, 2-227061

Int. Cl.[6] **H01L** *21/44;21/48*

U.S. Cl. 437—192 **9 Claims**



1. A method for manufacturing an interconnection structure of a semiconductor integrated circuit device comprising the steps of:

forming a first interconnection layer including aluminum on a main surface of a semiconductor substrate;

forming an insulating layer on said first interconnection layer;

selectively removing said insulating layer to form a through hole for exposing a surface of said first interconnection layer;

forming a titanium layer on said insulting layer, said titanium layer being in contact with the surface of said first interconnection layer through said through hole to form an interface between said titanium layer and said first interconnection layer;

forming a titanium compound layer on said titanium layer;

forming a second layer including aluminum on said titanium compound layer; and

forming a compound layer consisting essentially of titanium and aluminum at the interface between the titanium layer and the first interconnection layer.

5,488,015

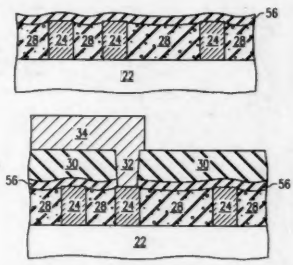
METHOD OF MAKING AN INTERCONNECT STRUCTURE WITH AN INTEGRATED LOW DENSITY DIELECTRIC

Robert H. Havemann, Garland; Shin-Puu Jeng, Plano; Bruce E. Gnade, Rowlett, and Chih-Chen Cho, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 20, 1994, Ser. No. 246,432

Int. Cl.[6] **H01L** *21/441;21/469*

U.S. Cl. 437—195 **9 Claims**



1. A method of constructing a semiconductor device comprising:

providing a layer of patterned conductors formed on a semiconductor substrate;

depositing and gelling a layer of a precursor solution on said substrate, thereby forming a wet gel layer having porous structure;

drying said wet gel layer without substantial densification of said porous structure, thereby forming a porous dielectric layer filling gaps between and covering said patterned conductors, said porous dielectric layer having a dielectric constant of less than 3.0, a porosity between 30% and 95%, and an average pore diameter of less than 80 nm;

removing a top portion of said porous dielectric layer; and

depositing a non-porous dielectric layer over said conductors and said porous dielectric layer to complete an interlayer dielectric, whereby the capacitive coupling between conductors on the same level is substantially reduced compared to a solid silicon dioxide dielectric and the mechanical properties of said interlayer dielectric are essentially the same as that of non-porous silicon dioxide.

5,488,016

CELLULATED BODIES PRODUCED FROM PHOSPHOROUS POLYMERS

Hermann L. Rittler, Corning, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Continuation of Ser. No. 86,515, Jul. 1, 1993, Pat. No. 5,403,519, which is a division of Ser. No. 630,544, Dec. 20, 1990, abandoned. This application Dec. 13, 1994, Ser. No. 355,071

Int. Cl.[6] **C03C** *11/00*

U.S. Cl. 501—39 **12 Claims**

1. A rigid glass or crystalline body that consists essentially of oxides of phosphorous and aluminum, that is thermally vitrified or crystallized from an amorphous, precursor, polymeric material consisting essentially of aluminum, phosphorous and carbon atoms and wherein the body is a cellulated body and has a bulk density no greater than one half that of the precursor polymeric material.

5,488,017

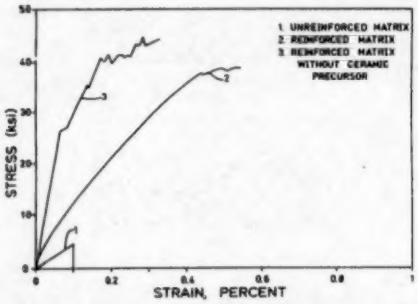
FIBERT REINFORCED CERAMIC MATRIX COMPOSITE MEMBER

Andrew Szweda, Middletown; Michael L. Millard, Sharonville, both of Ohio, and Michael G. Harrison, Bear, Del., assignors to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 129,002, Sep. 28, 1993, abandoned, which is a continuation of Ser. No. 740,549, Aug. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 341,000, Apr. 14, 1989, abandoned. This application Nov. 16, 1994, Ser. No. 341,339

Int. Cl.[6] B32B *5/28*

U.S. Cl. 501—95 **12 Claims**



1. A structural fiber reinforced ceramic matrix composite member consisting essentially of

a plurality of oxidation-stable reinforcing fibers;

a ceramic matrix comprising ceramic particles selected from the group consisting of alumina, zirconia, yttria, silica, hafnia and mixtures thereof and a silicate ceramic bonding phase, the ceramic matrix being interspersed about the reinforcing fibers so as to directly contact the reinforcing fibers;

the ceramic bonding phase being in intimate contact with the ceramic particles and the reinforcing fibers so as to directly bond together the ceramic particles and the reinforcing fibers; and

controlled porosity distributed throughout the ceramic matrix so as to control the strength of the bond between the ceramic bonding phase and the reinforcing fibers;

wherein the ceramic matrix is formed by the ceramic particles and a slurry of a silicon-containing polymer substance selected from the group consisting of polycarbosilanes, vinylic polysilanes, dimethyl siloxane and silicone resins and combinations thereof, the slurry being interspersed about the reinforcing fibers and heated at a sufficient temperature in an oxidizing atmosphere so that the silicon-containing polymer substance is transformed to yield the ceramic bonding phase; and

wherein the fiber reinforced ceramic matrix composite member is characterized by an ultimate tensile strength of greater than about 15 ksi and a percent elongation at failure of greater than about 0.2%.

5,488,018

ULTRA LOW THERMAL EXPANSION, HIGHLY THERMAL SHOCK RESISTANT CERAMIC

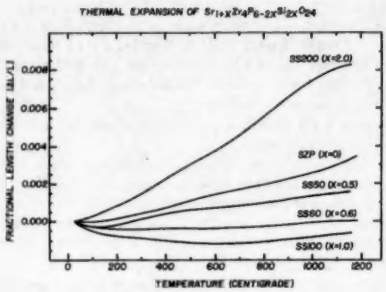
Santosh Y. Limaye, 1440 Sandpiper Cir. #38, Salt Lake City, Utah 84117

Filed Apr. 21, 1989, Ser. No. 341,732

Int. Cl.[6] C04B *35/48*

U.S. Cl. 501—104 **19 Claims**

1. A ceramic having substantially neutral bulk thermal expansion and anisotropy consisting essentially of a substantially single phase composition of $\phi_{1+x}\theta_x P_{6-2x}Si_{2x}O_{24}$ wherein X is a number having a value of between about 0.2 and 0.8, ϕ is either strontium, barium or mixtures thereof, and θ is either zirconium, hafnium, or mixtures thereof; said bulk material thermal expansion being over a temperature of from about 0° C. to about 1200° C.



5,488,019

DIELECTRIC CERAMIC COMPOSITION CONTAINING ZNO-B_2O_3-SIO_2 GLASS, METHOD OF PREPARING THE SAME, AND RESONATOR AND FILTER USING THE DIELECTRIC CERAMIC COMPOSITION

Masahiro Abe; Tsutomu Nanataki, and Shinsuke Yano, all of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Division of Ser. No. 181,423, Jan. 14, 1994, Pat. No. 5,350,721, which is a division of Ser. No. 102,059, Aug. 4, 1993, Pat. No. 5,304,521, which is a division of Ser. No. 948,585, Sep. 23, 1992, Pat. No. 5,264,403. This application May 31, 1994, Ser. No. 251,567

Claims priority, application Japan, Sep. 27, 1991, 3-276587; Mar. 18, 1992, 4-92180; Mar. 18, 1992, 4-92182; Mar. 25, 1992, 4-98862; Sep. 21, 1992, 4-276594; Sep. 21, 1992, 4-276595; Sep. 21, 1992, 4-276596

Int. Cl.[6] C04B *35/40*

U.S. Cl. 501—139 **4 Claims**

1. A method of preparing a dielectric ceramic composition, comprising the steps of:

providing starting materials which give a main ceramic composition containing barium oxide, titanium oxide, rare earth oxide and bismuth oxide as major components, which composition is represented by $xBaO.yTiO_2.z((1-a)RE_2O_3.aBi_2O_3)$, wherein RE represents at least one rare earth metal, $0.10 \leqq x \leqq 0.20$, $0.60 \leqq y \leqq 0.75$, $0.10 \leqq z \leqq 0.25$, $x+y+z=1$ and $0<a \leqq 0.3$;

excluding at least a part of bismuth oxide from said starting materials which give said main ceramic composition;

calcining and pulverizing a mixture of said starting materials to provide a calcined ceramic powder; and

blending said calcined ceramic powder with said at least a part of bismuth oxide and a glass composition containing ZnO, B_2O_3 and SiO_2, which is represented by k(wt. %)ZnO.m(wt. %)B_2O_3.n(wt. %)SiO_2, wherein $30 \leqq k \leqq 85$, $5 \leqq m \leqq 50$, $2 \leqq n \leqq 40$, $k+m+n=100$, said glass composition being contained in an amount of at least 0.1 parts by weight, but not more than (18–62.5a) parts by weight (where $0<a \leqq 0.2$) or not more than 5.5 parts by weight (where $0.2<a \leqq 0.3$), per 100 parts by weight of said main ceramic composition.

5,488,020

COPPER-IMPREGNATED ZEOLITE COMPOSITION

Ronald W. Diesen; Kenneth A. Burdett; Ravi S. Dixit, and Stanley S. T. King, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 954,710, Sep. 30, 1992, Pat. No. 5,329,057, which is a continuation-in-part of Ser. No. 688,808, Apr. 19, 1991, Pat. No. 5,196,621. This application Feb. 23, 1994, Ser. No. 200,258

Int. Cl.[6] C07C *2/50*

U.S. Cl. 502—60 **17 Claims**

1. A catalyst composition comprising a copper(I)-impregnated aluminosilicate zeolite wherein the zeolite is selected from the group consisting of faujasites, zeolite L, and zeolite Ω, and wherein the zeolite is characterized by a silica to bulk alumina molar ratio in the range from about 12 to about 50 and a silica to framework alumina molar ratio of at least about 15, and wherein optionally, the catalyst contains a binder, the composition being prepared by a process comprising (a) drying an aluminosilicate zeolite to remove water, the zeolite being selected form the group consisting faujasites, zeolite L, and zeolite Ω, and being characterized by a silica to bulk alumina molar ratio in the range from about 12 to about 50 and a silica to framework alumina molar ratio of at least about 15, (b) impregnating the dried zeolite with a solution containing a copper(II) salt, (c) calcining the copper(II)-impregnated zeolite under oxygen at a temperature between about 200° C. and about 325° C. under conditions such that the anion of the salt is removed, and (d) reducing the calcined copper(II)-impregnated zeolite with an olefinic hydrocarbon such that a portion of the copper(II) ions are converted to copper(I).

5,488,021

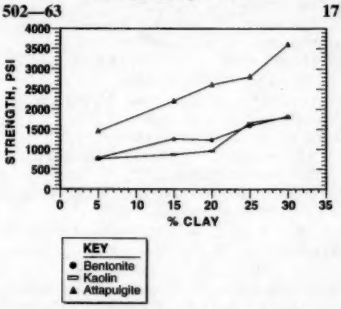
ACTIVATED CARBON BODIES HAVING CLAY BINDER AND METHOD OF MAKING SAME

Evelyn M. DeLiso, and Kenneth E. Zaun, both of Corning, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Dec. 17, 1993, Ser. No. 168,170

Int. Cl.[6] B01J *29/06*

U.S. Cl. 502—63 **17 Claims**



1. A method for making a carbon body, said method consisting essentially of:

a) forming an aqueous mixture comprising about 2% to 30attapulgite clay, about 2% to 12% plasticizing organic binder selected from the group consisting of methylcellulose, ethylhydroxy ethylcellulose, hydroxybutylcellulose, hydroxybutyl methylcellulose, hydroxyethylcellulose, hydroxymethylcellulose, hydroxypropylcellulose, hydroxypropyl methylcellulose, hydroxyethyl methylcellulose, sodium carboxy methylcellulose, and mixtures thereof, and the balance being activated carbon particles;

b) forming said mixture into a body; and

c) drying the formed body.

10. A body comprised of activated carbon particles bonded together with about 2% to 30% by weight attapulgite clay binder and about 2% to 12% plasticizing organic binder selected from the group consisting of methylcellulose, ethylhydroxy ethylcellulose, hydroxybutylcellulose, hydroxybutyl methylcellulose, hydroxyethylcellulose, hydroxymethylcellulose, hydroxypropylcellulose, hydroxypropyl methylcellulose, hydroxyethyl methylcellulose, sodium carboxy methylcellulose, and mixtures thereof.

5,488,022

CATALYST COMPONENT FOR OLEFIN POLYMERIZATION

Tadashi Takahashi; Takashi Fujita; Kazuo Nakamura, and Seiichi Tsukamoto, all of Yokkaichi, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Oct. 22, 1993, Ser. No. 139,805

Claims priority, application Japan, Jan. 28, 1992, 4-290441

Int. Cl.[6] B01J *31/00*

U.S. Cl. 502—115 **13 Claims**

1. A catalyst component for olefin polymerization which comprises an intimate mixture of:

Component (A1) which is a solid component for Ziegler catalysts comprising titanium, magnesium and a halogen as essential components in a particulate form; and

component (A2) which is a compound selected from the group consisting of inorganic oxides, inorganic carbonates, inorganic sulfates and physical or chemical mixtures thereof in a particulate form;

wherein Component (A2) is employed in a weight ratio to Component (A1) from 0.001 to 0.5 and has an average particle diameter smaller than that of Component (A1), and wherein the ratio of the average particle diameter of Component (A2) to that of Component (A1) is in the range of from 0.0001 to 0.5 and wherein the sticky particles of Component (A1) are coated with the particles of Component (A2) in order to avoid clogging of the polymerization bed.

5,488,023

METHOD OF MAKING ACTIVATED CARBON HAVING DISPERSED CATALYST

Kishor P. Gadkaree, Big Flats; Mallanagouda D. Patil, and Steven B. Dawes, both of Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Aug. 12, 1994, Ser. No. 289,434

Int. Cl.[6] B01J *21/18*

U.S. Cl. 502—182 **22 Claims**

1. A method of making an activated carbon supported catalyst, the method comprising:

a) combining a liquid thermosetting resin carbon precursor and a catalyst precursor wherein the catalyst precursor is in a soluble form;

b) curing the thermosetting resin;

c) carbonizing the thermosetting resin; and

d) activating the carbon to produce an activated carbon supported catalyst.

5,488,024

SELECTIVE ACETYLENE HYDROGENATION

Tin-Tack P. Cheung; Marvin M. Johnson; Scott H. Brown; Stan A. Zisman, and James B. Kimble, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 1, 1994, Ser. No. 269,723

Int. Cl.[6] B01J *23/00;23/58*

U.S. Cl. 502—325 **38 Claims**

1. A preparation method which consists essentially of the steps of:

(1) contacting (a) a solid composition comprising palladium, silver and an inorganic support material with (b) a liquid reduction composition comprising (i) at least one reducing agent selected from the group consisting of hydrazine and alkali metal borohydrides and (ii) at least one non-reducing

liquid component, at a temperature of up to about 60° C. for a time period of at least about 1 second, so as to produce a wet-reduced solid composition;

(2) substantially separating said wet-reduced solid composition produced in step (1) from said liquid reduction composition: and

(3) drying the substantially separated, wet-reduced solid composition obtained in step 2.

5,488,025

DYE-RECEIVING ELEMENT CONTAINING ELASTOMERIC BEADS IN OVERCOAT LAYER FOR THERMAL DYE TRANSFER

Thomas W. Martin, Rochester; William H. Simpson, Pittsford, and Jacob J. Hastreiter, Jr., Spencerport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 7, 1995, Ser. No. 473,805

Int. Cl.[6] B41M *5/035;5/38*

U.S. Cl. 503—227 **12 Claims**

5. A process of forming a dye transfer image comprising:

a) imagewise-heating a dye-donor element comprising a support having thereon a dye layer comprising a dye dispersed in a binder, and

b) transferring a dye image to a dye-receiving element comprising a reflective support having thereon a dye image-receiving layer to form said dye transfer image,

wherein said dye image-receiving layer has an overcoat layer thereon containing crosslinked elastomeric beads having a Tg of 45° C. or less, said elastomeric beads being made from an acrylic polymer, an acrylic copolymer or a styrenic copolymer, said elastomeric beads having a particle size of less than about 1 μm and are present at a coverage of from about 0.2 to about 1.0 g/m^2.

5,488,026

THERMAL DYE TRANSFER SYSTEM WITH RECEIVER CONTAINING AN ACID-GENERATING COMPOUND

Leslie Shuttleworth; Helmut Weber, and Franklin D. Saeva, all of Webster, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 6, 1995, Ser. No. 469,972

Int. Cl.[6] B41M *5/035;5/38*

U.S. Cl. 503—227 **14 Claims**

8. A process of forming a dye transfer image comprising

1) imagewise-heating a dye-donor element comprising a support having thereon a dye layer comprising a dye dispersed in a polymeric binder, said dye being a deprotonated cationic dye which is capable of being reprotonated to a cationic dye having a N-H group which is part of a conjugated system,

2) imagewise transferring said dye to a dye-receiving element, said dye-receiving element comprising a support having thereon a polymeric dye image-receiving layer, said polymeric dye image-receiving layer containing a compound capable of generating an acid upon exposure to UV light, said acid being capable of reprotonating said deprotonated cationic dye, and

3) subjecting said dye-receiving element to UV radiation to generate said acid to reprotonate said deprotonated dye and form said dye transfer image.

5,488,027

HERBICIDE-SAFENER COMBINATIONS CONTAINING SULFONYLUREA OR IMIDAZOLINONE HERBICIDES

Klaus Bauer, Hanau, and Hermann Bieringer, Eppstein/Taunus, both of, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Dec. 19, 1991, Ser. No. 810,211

Claims priority, application Germany, Dec. 21, 1990, 40 41 120.6

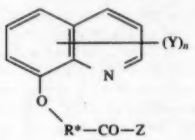
Int. Cl.[6] A01N *25/32;43/42*

U.S. Cl. 504—105 **11 Claims**

1. A herbicidal composition which comprises an effective amount of

A) one or more herbicides from the group of the sulfonylureas and

B) one or more compounds of the formula B2,



(B2)

in which

Y is 5-Cl

R* is a C_1–C_2-alkylene chain which can additionally be substituted by one or two C_1–C_4-alkyl radicals, and

Z is OR^1,

R^1 independently of R is hydrogen, C_1–C_{18}-alkyl, C_3–C_{12}-cycloalkyl, C_2–C_8-alkenyl or C_2–C_8-alkynyl,

each of the above carbon-containing radicals independently of one another being unsubstituted or monosubstituted or polysubstituted by radicals selected from the group consisting of halogen, hydoxyl, C_1–C_8-alkoxy, C_1–C_8-alkylthio, C_2–C_8-alkenylthio, C_2–C_8-alkynylthio, C_2–C_8-alkenyloxy, C_2–C_8-alkynyloxy, C_3–C_7-cycloalkyl, C_3–C_7-cycloalkoxy, cyano, mono- and di-(C_1–C_4-alkyl)amino, (C_1–C_8-alkoxy)carbonyl, (C_2–C_8-alkenyl-oxy)carbonyl, (C_1–C_8-alkylthio)carbonyl, (C_2–C_8-alkynyloxy)carbonyl, (C_1–C_8-alkyl)carbonyl, (C_2–C_8-alkenyl)carbonyl, (C_2–C_8-alkynyl)carbonyl, 1-(hydroxyimino)-C_1–C_6-alkyl, 1-(C_1–C_4-alkylimino)-C_1–C_6-alkyl, 1-(C_1–C_4-alkoxyimino)-C_1–C_6-alkyl, (C_1–C_8alkyl)carbonylamino, (C_2–C_8-alkenyl)carbonyl-amino, (C_2–C_8-alkynyl)carbonylamino, aminocarbonyl, (C_1–C_8-alkyl)aminocarbonyl, di-(C_1–C_6-alkyl)aminocarbonyl, (C_2–C_6-alkenyl)aminocarbonyl, (C_2–C_6-alkynyl)aminocarbonyl, (C_1–C_8-alkoxy)carbonylamino, (C_1–C_8-alkyl)aminocarbonylamino, C_1–C_6-alkylcarbonyloxy which is unsubstituted or substituted by halogen, NO_2, C_1–C_4-alkoxy or optionally substituted phenyl, (C_2–C_6-alkenyl)carbonyloxy, (C_2–C_6-alkynyl)carbonyloxy, C_1–C_8-alkylsulfonyl, phenyl, phenyl-C_1–C_6-alkoxy, phenyl-(C_1–C_6-alkoxy)carbonyl, phenoxy, phenoxy-C_1–C_6-alkoxy, phenoxy-(C_1–C_6-alkoxy)carbonyl, phenylcarbonyloxy, phenylcarbonylamino, phenyl-(C_1–C_6-alkyl)carbonylamino, where the 9 last-mentioned radicals in the phenyl ring are unsubstituted or monosubstituted or polysubstituted by radicals selected from the group consisting of halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl, C_1–C_4-haloalkoxy and nitro, and radicals of the formulae —SiR'_3, —$OSiR'_3$, $(R')_3Si$-C_1–C_6-alkoxy, —CO—O—NR'_2, —O—N=CR'_2, —N=CR'_2, —O—NR'_2—$CH(OR')_2$ and —O—$(CH_2)_{m-CH(OR')2}$, where the R' radicals in the formulae mentioned independently of each other are hydrogen, C_1–C_4-alkyl or phenyl which is unsubstituted or monosubstituted or polysubstituted by radicals selected from the group consisting of halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl, C_1–C_4-haloalkoxy and nitro, or, in pairs, are a C_2–C_6-alkylene chain and m=0 to 6, and an alkoxy radical of the formula R"O—CHR"'(OR")-C_1–C_6-alkoxy where the R"

radicals independently of each other are C_1–C_4-alkyl or together are a C_1–C_6-alkylene group, and R''' is hydrogen or C_1–C_4-alkyl, and

n is 1.

5,488,028

HERBICIDAL SULPHONYLAMINOCARBONYLTRIAZOLINONES HAVING TWO SUBSTITUENTS BONDED VIA OXYGEN

Wilhelm Haas, Kerpen; Klaus-Helmut Müller, Duesseldorf; Klaus König, Odenthal; Hans-Joachim Santel, Leverkusen; Klaus Lürssen, and Robert R. Schmidt, both of Bergisch Gladbach, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

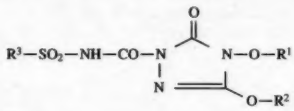
Division of Ser. No. 945,194, Sep. 15, 1992, Pat. No. 5,300,480, which is a continuation-in-part of Ser. No. 816,365, Dec. 30, 1991, Pat. No. 5,241,074, which is a division of Ser. No. 692,439, Apr. 29, 1991, Pat. No. 5,094,683, which is a division of Ser. No. 556,052, Jul. 20, 1990, Pat. No. 5,057,144, which is a continuation-in-part of Ser. No. 337,775, Apr. 13, 1989, abandoned. This application Dec. 28, 1993, Ser. No. 174,495

Claims priority, application Germany, Sep. 25, 1991, 41 31 842.0

Int. Cl.[6] **A01N** *43/80;43/78;* **C07D** *417/12;409/12*

U.S. Cl. 504—193 **8 Claims**

1. A sulphonylaminocarbonyltriazolinone having two substituents bonded via oxygen, of the formula



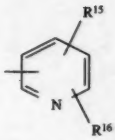
(I)

in which

R^1 represents C_1–C_6-alkyl, C_1–C_6-alkyl substituted by one or more members selected from the group consisting of fluorine, chlorine, bromine, cyano, C_1–C_4-alkoxy, C_1–C_4-alkylcarbonyl and C_1–C_4-alkoxycarbonyl, or represents C_3–C_6-alkenyl or C_3–C_6-alkinyl, or represents C_1–C_6-alkenyl or C_1–C_6-alkinyl each of which is substituted by one or more members selected from the group consisting of fluorine, chlorine and bromine, or represents C_3–C_7cycloalkyl or C_4–C_7-cycloalkenyl, or represents C_3–C_7-cycloalkyl or C_4–C_7-cycloalkenyl each of which is substituted by one or more members selected from the group consisting of fluorine, chlorine, bromine and C_1–C_4-alkyl, or represents phenyl-C_1–C_3-alkyl, or phenyl C_1–C_3-alkyl which is substituted by one or more members selected from the group consisting of fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkoxy and C_1–C_4-alkoxy-carbonyl,

R^2 represents C_1–C_6-alkyl or C_1–C_6-alkyl which is substituted by one or more members selected from the group consisting of fluorine, chlorine, bromine, cyano, C_3–C_6-cycloalkyl, C_1–C_4-alkoxy and C_1–C_4-alkoxycarbonyl, or represents C_3–C_6-alkenyl or C_3–C_6-alkinyl, or represents C_3–C_6-alkenyl or C_3–C_6-alkinyl each of which is substituted by one or more members selected from the group consisting of fluorine, chlorine and bromine, or represents C_3–C_6-cycloalkyl, or C_3–C_6-cycloalkyl which is substituted by one or more members selected from the group consisting of fluorine, chlorine, bromine and C_1–C_4-alkyl, or represents cyclohexenyl, or represents phenyl-C_1–C_3-alkyl, or phenyl-C_1–C_3-alkyl which is substituted by one or more members selected from the group consisting of fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl, trifluoromethyl, C_1–C_6-alkoxy and C_1–C_4-alkoxy-carbonyl,

R^3 represents the radical

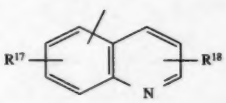


where

R^{15} and R^{16} are identical or different and represent hydrogen, fluorine, chlorine, bromine, nitro, cyano, C_1–C_4-alkyl (which is unsubstituted or substituted by one or more of fluorine and chlorine), C_1–C_4-alkoxy (which is unsubstituted or substituted by one or more of fluorine, and chlorine), or represent C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl (which are unsubstituted or substituted by one or more of fluorine and chlorine), or represent aminosulphonyl, mono-(C_1–C_4-alkyl)-aminosulphonyl, or represent di-(C_1–C_4-alkyl)-aminosulphonyl or C_1–C_4-alkoxycarbonyl or dimethylaminocarbonyl;

furthermore

R^3 represents the radical

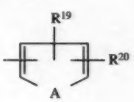


where

R^{17} and R^{18} each independently represents hydrogen, fluorine, chlorine, bromine, C_1–C_4-alkyl (which is unsubstituted or substituted by one or more of fluorine and bromine), C_1–C_4-alkoxy (which is unsubstituted or substituted by fluorine and/or chlorine), or represent C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl (which are unsubstituted or substituted by one or more of fluorine and chlorine), or represent di-(C_1–C_4-alkyl)-amino-sulphonyl;

furthermore

R^3 represents the radical



where

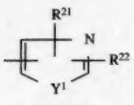
R^{19} and R^{20} each independently represents hydrogen, fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl (which is unsubstituted or substituted by one or more of fluorine and chlorine), C_1–C_4-alkoxy (which is unsubstituted or substituted by one or more of fluorine and chlorine), C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl (which is unsubstituted or substituted by one or more of fluorine and chlorine), di-(C_1–C_4-alkyl)-amino-sulphonyl, C_1–C_4-alkoxy-carbonyl or dimethyl-aminocarbonyl, and

A represents oxygen, sulphur or the group N—Z^1, where

Z^1 represents hydrogen, C_1–C_4-alkyl (which is unsubstituted or substituted by fluorine, chlorine, bromine or cyano), C_3–C_6-cycloalkyl, benzyl, phenyl (which is unsubstituted or substituted by fluorine, chlorine, bromine or nitro), C_1–C_4-alkyl-carbonyl, C_1–C_4-alkoxy-carbonyl or di-(C_1–C_4-alkyl)-aminocarbonyl; chlorine, bromine or nitro), C_1–C_4-alkyl-carbonyl, C_1–C_4-alkyl-carboxy-carbonyl or di-(C_1–C_4-alkyl)aminocarbonyl;

furthermore

R^3 represents the radical



where

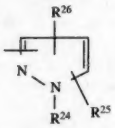
R^{21} and R^{22} each independently represents hydrogen, C_1–C_4-alkyl, halogen, C_1–C_4-alkoxy-carbonyl, C_1–C_4-alkoxy or C_1–C_4-halogenoalkoxy,

Y^1 represents sulphur or the group N—R^{23}, where

R^{23} represents hydrogen or C_1–C_4-alkyl;

furthermore

R^3 represents the radical



where

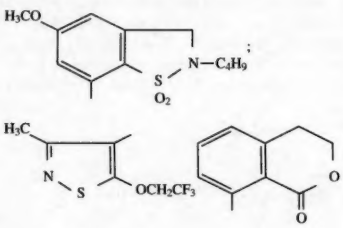
R^{24} represents hydrogen, C_1–C_4-alkyl, benzyl, pyridyl, quinolinyl or phenyl,

R^{25} represents hydrogen, halogen, cyano, nitro, C_1–C_4-alkyl (which is unsubstituted or substituted by one or more of fluorine and chlorine), C_1–C_4-alkoxy (which is unsubstituted or substituted by one or more of fluorine and chlorine), dioxolanyl or C_1–C_4-alkoxy-carbonyl, and

R^{26} represents hydrogen halogen, or C_1–C_4-alkyl;

or

R^3 represents



or a salt thereof.

5,488,029

HERBICIDAL N- [1,3,5-RIAZIN-2-YL)-AMINOCARBONYL]-BENZENESULFONAMIDES

Gerhard Hamprecht, Weinheim; Horst Mayer, Ludwigshafen; Karl-Otto Westphalen, Speyer; Matthias Gerber, Limburgerhof; Uwe Kardorff, Mannheim, and Helmut Walter, Obrigheim, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP93/00364, § 371 Date Jun. 17, 1994, § 102(e) Date Jun. 17, 1994, PCT Pub. No. WO93/17001, PCT Pub. Date Sep. 2, 1993

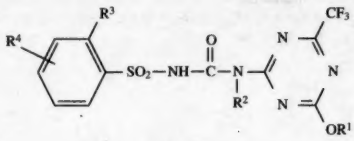
PCT Filed Feb. 16, 1993, Ser. No. 244,945

Claims priority, application Germany, Feb. 28, 1992, 42 06 146.6

Int. Cl.[6] C07D *251/42;* **A01N** *43/66*

U.S. Cl. 504—212 **4 Claims**

1. An N-((1,3,5-triazin-2-yl)-aminocarbonyl)-benzenesulfonamide of the formula I



I

where

R^1 is methyl or ethyl;

R^2 is hydrogen or methyl;

R^3 is C_2–C_4-haloalkyl; or

R^3 is a group ER^5 in which E is O or S and R^5 is C_1-alkyl which carries from 1 to 3 fluorine atoms or C_2-alkyl which carries form 1 to 5 fluorine atoms, with the exception of difluoromethoxy; and

R^4 is hydrogen, methyl, ethyl, methoxy, ethoxy, methylthio, ethylthio, C_1- or C_2-haloalkoxy, fluorine or chlorine;

and agriculturally useful salts thereof.

5,488,030

SUPERCONDUCTOR JUNCTION STRUCTURE INCLUDING TWO OXIDE SUPERCONDUCTOR LAYERS SEPARATED BY A NON-SUPERCONDUCTING LAYER

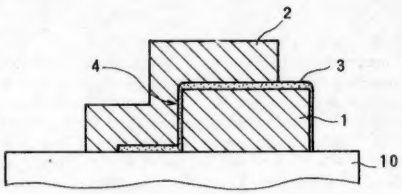
Saburo Tanaka; Takashi Matsuura, and Hideo Itozaki, all of Itami, Japan, assignors to Sumitomo Electric Industries, Inc., Japan

Continuation of Ser. No. 126,753, Sep. 27, 1993, abandoned, which is a continuation of Ser. No. 759,548, Sep. 13, 1991, abandoned. This application Dec. 29, 1994, Ser. No. 366,408

Claims priority, application Japan, Sep. 20, 1990, 2-251620

Int. Cl.[6] H01B *12/00;* **H01L** *29/06;39/22*

U.S. Cl. 505—190 **12 Claims**



1. A superconductor junction structure, comprising:

a first superconducting layer made of an oxide superconductor material formed in a desired pattern on a substrate;

a unitary non-superconducting layer of a non-superconductor material formed on at least a part of a side face of said first superconducting layer and on an upper surface of said first superconducting layer, wherein a portion of a surface of the substrate is near said part, wherein a thickness of said non-superconducting layer on said part of said side face is thinner than a thickness of said non-superconducting layer on said upper surface, wherein the non-superconducting layer extends in a first direction along the surface of the substrate, and wherein the thickness of the non-superconducting layer on the side face is less than a length of the non-superconducting layer extending in the first direction along the surface of the substrate; and

a second superconducting layer made of said oxide superconductor material of said first superconducting layer formed on at least a portion of said non-superconducting layer on said part of said side surface and said upper surface of said first superconducting layer, wherein a c-crystallographic axis of each of said first and second superconducting layers is perpendicular to the surface of the substrate, such that a superconductor junction is formed between said first superconducting layer and said second superconducting layer through said part in a direction parallel with said substrate.

5,488,031

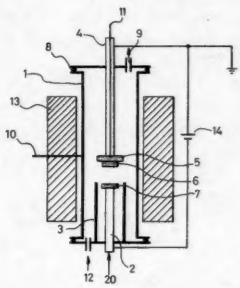
PROCESS FOR MAKING HIGH TEMPERATURE SUPERCONDUCTING OXIDE FILMS

Ran-Jin Lin, Hsinchu, Taiwan, Prov. of China, assignor to Industrial Technology Research Institute, Taipei, Taiwan, Prov. of China

Division of Ser. No. 176,725, Jan. 3, 1994, Pat. No. 5,441,623. This application Apr. 5, 1995, Ser. No. 417,771

Int. Cl.[6] H01L *39/24;* C23C *14/34*

U.S. Cl. 505—475 12 Claims



1. A process for the preparation of high temperature superconducting oxide films, comprising the following steps:

(a) respectively placing a substrate on an anode and a sintered body of an oxide superconductor on a cathode in a deposition chamber, wherein the sintered body on the cathode is used as a sputtering target;

(b) adjusting the positions of the cathode and the anode so as to control the distance between the surface of the substrate and the surface of the sputtering target;

(c) exhausting gases from the deposition chamber to a pressure below 10^{-3} torr and then introducing pure oxygen to a pressure of 1 atmosphere;

(d) heating the substrate to a desired temperature under said pressure of 1 atmosphere in the deposition chamber;

(e) again exhausting the gases from the deposition chamber and then introducing a mixture of argon and oxygen gases and maintaining a desired gas pressure by an automatic pressure-control valve;

(f) turning on an electric power supply to produce glow discharge between the substrate and the sputtering target so as to grow a superconducting oxide film on the substrate to a desired thickness; and

(g) cooling the coated substrate to a temperature below 100° C. to in-situ obtain the high temperature superconducting oxide film.

5,488,032

METHOD OF USING SOLUBLE HUMAN INTERLEUKIN-1 RECEPTORS TO SUPPRESS INFLAMMATION

Steven K. Dower, Redmond; Carl J. March, Winslow; John E. Sims, and David L. Urdal, both of Seattle, all of Wash., assignors to Immunex Corporation, Seattle, Wash.

Division of Ser. No. 455,488, Dec. 21, 1989, Pat. No. 5,180,812, which is a continuation-in-part of Ser. No. 258,756, Oct. 19, 1988, Pat. No. 5,081,228, which is a continuation-in-part of Ser. No. 160,550, Feb. 25, 1988, Pat. No. 4,968,607, which is a continuation-in-part of Ser. No. 125,627, Nov. 25, 1987, abandoned. This application Jun. 17, 1992, Ser. No. 904,073

Int. Cl.[6] A61K *38/16;* C07K *14/705*

U.S. Cl. 514—2 6 Claims

1. A method for suppressing IL-1 mediated inflammation in a mammal comprising administering an effective amount of soluble IL-1R.

5,488,033

TREATMENT TO REDUCE EDEMA

Edward T. Wei, Berkeley, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 876,487, Apr. 30, 1992, Pat. No. 5,306,710, which is a division of Ser. No. 386,885, Jul. 28, 1989, Pat. No. 5,137,871. This application Apr. 19, 1994, Ser. No. 229,911

Int. Cl.[6] A61K *38/35*

U.S. Cl. 514—12 5 Claims

1. A method of treating a patient suffering from a systemic inflammatory response syndrome characterized by vascular leakage, comprising:

administering to the patient an amount of a corticotropin-releasing factor effective to suppress vascular leakage.

5,488,034

PHARMACEUTICAL COMPOSITION COMPRISING BPI PROTEINS

Weldon C. McGregor, Los Angeles; James Stubstad, Lafayette, and C. Paul Chang, Chatsworth, all of Calif., assignors to XOMA Corporation, Berkeley, Calif.

Continuation-in-part of Ser. No. 12,360, Feb. 2, 1993, abandoned. This application Feb. 2, 1994, Ser. No. 190,869

Int. Cl.[6] A61K *35/14;38/16*

U.S. Cl. 514—12 6 Claims

1. A pharmaceutical composition comprising a bactericidal/permeability-increasing (BPI) protein or BPI fragment thereof, or a BPI analog of said bactericidal/permeability-increasing protein or BPI fragment, in combination with a polyoxypropylene-polyoxyethylene block copolymer (poloxamer) surfactant in a solubilizing/stabilizing concentration.

5,488,035

PEPTIDE WITH INHIBITORY ACTIVITY TOWARDS PLANT PATHOGENIC FUNGI

Aragula G. Rao, Polk County, Iowa, assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Dec. 6, 1991, Ser. No. 802,794

Int. Cl.[6] A61K *38/00;38/04;* C07K *5/00;7/00*

U.S. Cl. 514—13 5 Claims

1. A method for killing and inhibiting plant pathogenic fungi which are susceptible to tachyplesin, comprising introducing into the environment of the pathogenic microorganisms an antimicrobial amount of tachyplesin.

5,488,036

METHOD FOR STERILIZING ANIMALS USING HORMONE-TOXIN CONJUGATE COMPOUNDS

Torrance M. Nett, Ft. Collins, and Leonard M. Glode, Aurora, both of Colo., assignors to Colorado State University Research Foundation, Fort Collins, Colo.

Division of Ser. No. 837,639, Feb. 14, 1992, Pat. No. 5,378,688, which is a continuation-in-part of Ser. No. 314,653, Feb. 23, 1989, abandoned. This application Jul. 20, 1993, Ser. No. 94,625

Int. Cl.[6] A61K *38/00;* C07K *5/00;7/00;17/00*

U.S. Cl. 514—15 18 Claims

1. A method for using at least one hormone/toxin conjugate to sterilize an animal, said conjugate comprising a peptide hormone capable of binding to a GnRH receptor, conjugated by a linking agent to a toxin group selected from the group consisting of a chemical toxin, a single chain toxin, and a modified toxin having an intrinsic toxic group lacking a functional binding domain, said conjugate capable of selectively binding to a gonadotroph and of substantially precluding said gonadotroph from secreting gonadotropins, said method comprising administering an effective amount

of said conjugate to said animal to substantially preclude secretion of gonadotropins by said animal's gonadotrophs, wherein said conjugate is capable of crossing the cell membrane of a gonadotroph.

5,488,037

ANTITHROMBOTIC AGENTS

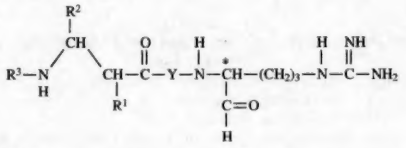
Daniel J. Sall, and Robert T. Shuman, both of Greenwood, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 4, 1994, Ser. No. 206,499

Int. Cl.[6] A61K *38/00;* **C07D** *417/00;279/10;279/12*

U.S. Cl. 514—19 **35 Claims**

1. A compound having the formula



I

wherein

R^1 is hydrogen, C_1–C_4 alkyl, substituted or unsubstituted phenyl, substituted or unsubstituted phen(C_1–C_4)alkyl, cyclopentyl, cyclohexyl, cyclopentyl(C_1–C_4)alkyl, or cyclohexyl(C_1–C_4)alkyl;

R^2 is hydrogen, C_1–C_4 alkyl, substituted or unsubstituted phenyl, substituted or unsubstituted phen(C_1–C_4)alkyl, cyclopentyl, cyclohexyl, cyclopentyl(C_1–C_4)alkyl or cyclohexyl(C_1–C_4)alkyl;

R^3 is hydrogen, C_1–C_4 alkyl or (C_1–C_4 alkyl)$S(O)_n$

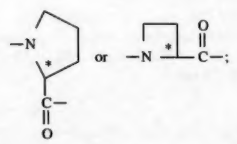
where n is 1 or 2;

R^1 and R^2, with the carbon atoms to which they are bonded, are combined to afford a 5 or 6 membered cycloalkyl group, a phenyl group or norbornanyl group;

R^2 and R^3, with the respective carbon and nitrogen atoms to which they are bonded, are combined to afford an unsubstituted or substituted 5 or 6 membered nitrogen containing heterocyclic ring which may further contain another hetero atom selected from nitrogen, oxygen and sulfur, or unsubstituted or substituted 9 or 10 membered nitrogen containing heterocyclic ring which may further contain another hetero atom selected from nitrogen, oxygen and sulfur;

R^1, R^2 and R^3, with the respective carbon and nitrogen atoms to which they are bonded, are combined to afford an unsubstituted or substituted 5 or 6 membered nitrogen containing heterocyclic ring or an unsubstituted or substituted 9 or 10 membered nitrogen containing heterocyclic ring which may further contain another hetero atom selected from nitrogen, oxygen and sulfur;

Y is



or pharmaceutically acceptable salts and solvates thereof; provided that when Y is prolinyl, R^1 is hydrogen and R^3 is hydrogen, R^2 is not phenyl; and further provided that when Y is prolinyl, R^2 is hydrogen and R^3 is hydrogen, R^1 is not benzyl; and further provided that R^3 is not hydrogen or (C_1–C_4 alkyl)$S(O)_n$ when R_1 and R_2 are each hydrogen.

5,488,038

DIBEKACIN DERIVATIVES AND ARBEKACIN DERIVATIVES ACTIVE AGAINST RESISTANT BACTERIA

Shinichi Kondo, Yohohama; Seiji Shibahara, Machida; Takayuki Usui, Kawasaki; Toshiaki Kudo, Yokohama; Shuichi Gomi, Tokyo; Atsushi Tamura, Yokohama; Yoko Ikeda, Tokyo; Daishiro Ikeda, Tokyo, and Tomio Takeuchi, Tokyo, all of, Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

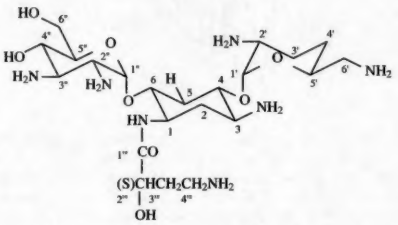
Filed Nov. 18, 1993, Ser. No. 154,002

Claims priority, application Japan, Nov. 27, 1992, 5-341314; Sep. 9, 1993, 5-247327

Int. Cl.[6] A61K *31/70;* **C07H** *15/22*

U.S. Cl. 514—41 **6 Claims**

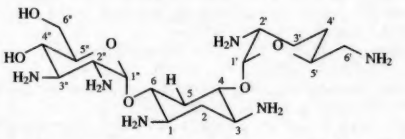
1. 2"-Amino-5,2"-dideoxyarbekacin having the formula



(I-2)

or a pharmaceutically acceptable acid addition salt thereof.

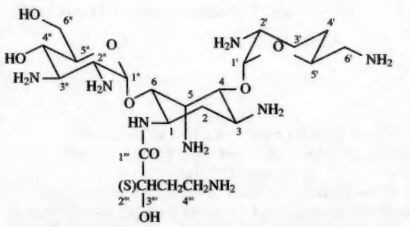
2. 2"-Amino-5,2"-dideoxydibekacin having the formula



(II-2)

or a pharmaceutically acceptable acid addition salt thereof.

3. 2"-Amino-5,2"-dideoxy-5-epi-aminoarbekacin having the formula



(XVI-2)

or a pharmaceutically acceptable acid addition salt thereof.

4. An antibacterial composition comprising an antibacterially effective amount of 2"-amino-5,2"-dideoxyarbekacin according to claim **1** or a pharmaceutically acceptable acid addition salt thereof as active ingredient, in combination with a pharmaceutically acceptable carrier for the active ingredient.

5. An antibacterial composition comprising an antibacterially effective amount of 2"-amino-5,2"-dideoxydibekacin according to claim **2** or a pharmaceutically acceptable acid addition salt thereof as active ingredient, in combination with a pharmaceutically acceptable carrier for the active ingredient.

5,488,039

METHOD FOR THE PRODUCTION OF AN ENTERAL FORMULA CONTAINING RIBO-NUCLEOTIDES

Marc L. Masor, Worthington; Gary E. Katz, and Douglas G. Bynum, both of Columbus, all of Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Jan. 10, 1994, Ser. No. 178,685

Int. Cl.[6] A61K *31/70;* C07H *19/00;* A23J *1/00;* A23G *3/00*

U.S. Cl. 514—43 8 Claims

1. A method for manufacturing an infant formula containing nucleotides said method comprising the steps of:

1) dispersing an appropriate quantity of a protein source in water sufficient to solubilize the protein, thereby forming a protein solution;

2) dissolving carbohydrates in water, thereby forming a carbohydrate solution;

3) mixing minerals in water, thereby forming a mineral solution;

4) combining appropriate quantities of said protein solution, said carbohydrate solution, said mineral solution, and a solution of oils containing oil soluble vitamins;

5) heat processing and homogenizing the combined solutions;

6) adding water soluble vitamins to the combined solution;

7) adding water to dilute the combined solution to the desired caloric density; the improvement comprising:

8) adding, subsequent to step 5, from 29 to 39 mg of CMP per liter of formula; 15 to 21 mg of UMP per liter of formula; 10 to 16 mg of AMP per liter of formula and 14 to 20 mg of GMP per liter of formula.

5,488,040

USE OF NEUTRAL SOLUBLE GLUCAN PREPARATIONS TO STIMULATE PLATELET PRODUCTION

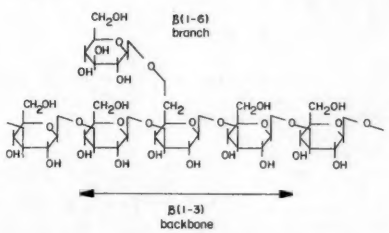
Spiros Jamas, Boston; D. Davidson Easson, Jr., Shrewsbury, and Gary R. Ostroff, Worcester, all of Mass., assignors to Alpha-Beta Technology, Inc., Worcester, Mass.

Continuation-in-part of Ser. No. 934,015, Aug. 21, 1992, and a continuation-in-part of Ser. No. 855,578, Mar. 23, 1992, abandoned, which is a continuation-in-part of Ser. No. 838,288, Mar. 5, 1992, which is a continuation-in-part of Ser. No. 404,738, Sep. 8, 1989, abandoned. This application May 11, 1993, Ser. No. 60,418

Claims priority, application WIPO, Sep. 6, 1990, PCT/US90/05041

Int. Cl.[6] A61K *31/715;* C07H *1/00;3/00*

U.S. Cl. 514—54 2 Claims



1. A method for stimulating platelet proliferation, comprising paraenterally administering to a mammal a platelet stimulating amount of a composition comprising an underivatized, aqueous soluble β(1–3) glucan in a physiologically acceptable vehicle, the underivatized, aqueous soluble β(1–3) glucan preparation being prepared by:

a) contacting β(1–3) glucan particles with an acid solution;

b) contacting the acid-treated particles from step a) with an alkali solution under conditions sufficient to dissolve alkali-soluble glucan;

c) separating alkali-insoluble particulates and glucan aggregates from the solution of step b); and

d) neutralizing the glucan solution obtained from step c).

5,488,041

METHOD OF PROMOTING BONE REPAIR USING TILUDRONIC DISODIUM SALT

Alain Barbier, Saint Clement La Riviere, and Frederic Lacheretz, Pignan, both of, France, assignors to Sanofi, Paris, France

Filed Apr. 4, 1994, Ser. No. 222,240

Claims priority, application France, Apr. 5, 1993, 93 03999

Int. Cl.[6] A61K *31/66;31/675*

U.S. Cl. 514—108 14 Claims

1. A method of promoting bone repair in a mammal which comprises administering to a mammal in need thereof a therapeutically effective amount of disodium salt of tiludronic acid.

5,488,042

METHOD FOR PROTECTION AGAINST GENOTOXIC MUTAGENESIS

David J. Grdina, Naperville, Ill., assignor to Arch Development Corporation, Chicago, Ill.

Filed Mar. 13, 1992, Ser. No. 851,210

Int. Cl.[6] A61K *31/66*

U.S. Cl. 514—114 4 Claims

1. A method for reducing mammal cell mutations induced by prior irradiation, comprising the step of:

(a) preparing a dosage of at least about 25 mg/kg of mammal body weight of a chemical compound selected from the group consisting of an aminoalkylphosphorothioate and an associated aminoalkylphosphorothioate metabolite; and

(b) administering said dosage to the mammal up to about 3 hours after irradiation of the mammal.

5,488,043

METHOD FOR STABILIZING ACEPHATE AND A DRY PESTICIDAL FORMULATION CONTAINING THE STABILIZED ACEPHATE

Masahiro Yamada, Takarazuka; Yasuyuki Katayama, Toyonaka, and Toshiro Ohtsubo, Sanda, all of, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Dec. 20, 1994, Ser. No. 360,042

Claims priority, application Japan, Dec. 20, 1993, 5-319595; May 9, 1994, 6-094813

Int. Cl.[6] A01N *57/28*

U.S. Cl. 514—120 13 Claims

1. A method for stabilizing acephate which comprises adding an effective amount of a sodium salt of condensed phosphate and/or an effective amount of a synthetic silicic acid in which the surface silanol groups being alkylsilylated, to acephate.

5,488,044

METHOD OF TREATING METABOLIC BONE DISEASE WITH (E)-20(22)-DEHYDROVITAMIN D COMPOUNDS

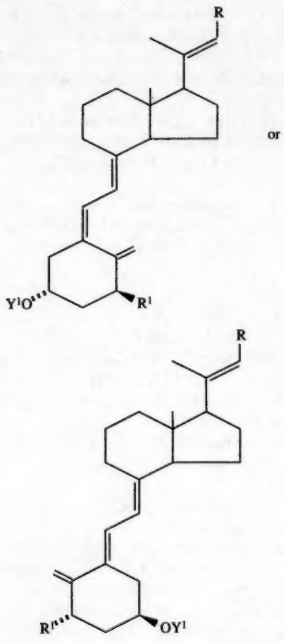
Hector F. DeLuca, Deerfield, Wis., and Rafal R. Sicinski, Warsaw, Poland, assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 147,663, Nov. 3, 1993. This application May 16, 1995, Ser. No. 441,775

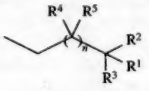
Int. Cl.[6] A61K *31/59;* C07C *401/00*

U.S. Cl. 514—167 8 Claims

1. A method of treating metabolic bone disease where it is desired to maintain or increase bone mass comprising administering to a patient with said disease a compound having the formula



where Y^1 is hydrogen or a hydroxy-protecting group, R^1 represents hydrogen, hydroxy or protected hydroxy, and where R is hydrogen, aryl, alkyl, hydroxyalkyl or fluoroalkyl group, or R may represent the following side chain fragment:



wherein R^1 is as defined above, R^2 and R^3 are each selected from the group consisting of alkyl, hydroxyalkyl and fluoroalkyl, or, when taken together represent the group $-(CH_2)_m-$ where m is an integer having a value of from 2 to 5, R^4 is selected from the group consisting of hydrogen, hydroxy, fluorine, O-acyl, alkyl, hydroxyalkyl and fluoroalkyl, R^5 is selected from the group consisting of hydrogen, fluorine, alkyl, hydroxyalkyl and fluoroalkyl, and wherein n is an integer having a value of from 1 to 5.

5,488,045

Patent Not Issued For This Number

5,488,046

CARBAMIC ACID DERIVATIVES OF SUBSTITUTED DIBENZOXAZEPINE COMPOUNDS, PHARMACEUTICAL COMPOSITIONS AND METHODS OF USE

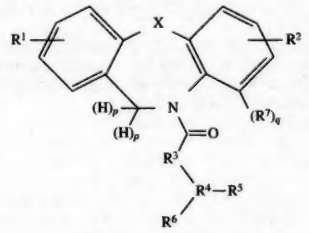
Robert A. Chrusciel, Portage, Mich.; Timothy J. Hagen, Gurnee; E. Ann Hallinan, Evanston, both of Ill.; Jinglin Li, St. Louis, Mo.; Sofya Tsymbalov, Des Plaines, Ill., and David B. Reitz, Chesterfield, Mo., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Nov. 3, 1993, Ser. No. 147,356

Int. Cl.[6] C07D *513/04;498/04;* **A61K** *31/55*

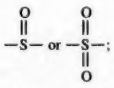
U.S. Cl. 514—211 **22 Claims**

1. A compound having a structure:



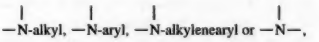
or a pharmaceutically-acceptable salt thereof, wherein:

X is oxygen, sulfur,

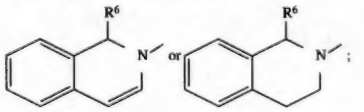


R^1, R^2 and R^7 may be the same or different and are hydrogen or halogen;

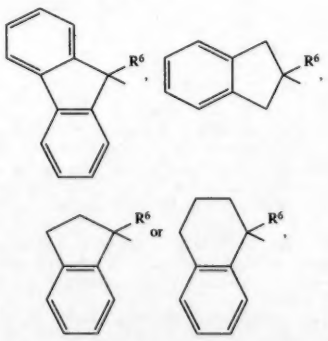
R^3 is oxygen, —NH—,



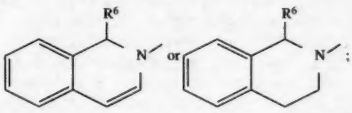
and can combine with R^4 and R^5 to form



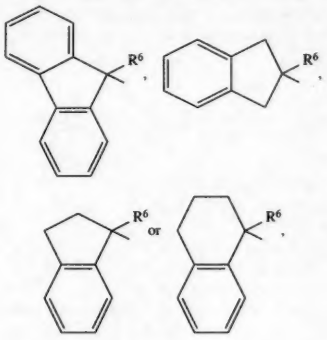
R^4 is carbon or —CH—, and can combine with R^5 to form carbonyl, an unsubstituted 4-, 5- or 6-membered nonaromatic, saturated, single-ring structure,



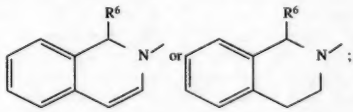
and can combine with R^3 and R^5 to form



R^5 is $—(CH_2)_m—$, oxygen, aryl, aralkyl, arylcarbonylhydroxy, arylcarbonylalkoxy, a mono- or di-valent alkylenearyl or a mono- or divalent alkenylenearyl, and can combine with R^4 to form carbonyl, an unsubstituted 4-, 5- or 6-membered nonaromatic, saturated, single-ring structure,



and can combine with R^3 and R^4 to form



R^6 is a single covalent bond to the carbon 9 of said compound;

p is 1;

q is 0; and

m is 3, 4 or 5;

with the-proviso that R^2 cannot be at the carbon 9 position of said compound.

5,488,047

CARBOXYALKYL TRICYLIC DERIVATIVES USEFUL AS INHIBITORS OF ENKEPHALINASE AND ACE

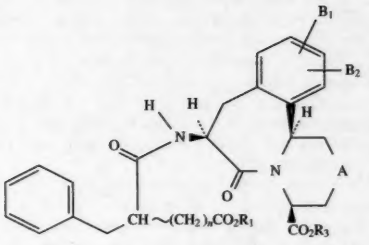
Alan M. Warshawsky, and Gary A. Flynn, both of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 148,076, Nov. 2, 1993, Pat. No. 5,455,242, which is a continuation-in-part of Ser. No. 993,499, Dec. 18, 1992, abandoned, which is a continuation of Ser. No. 935,672, Aug. 25, 1992, abandoned, which is a continuation of Ser. No. 767,281, Sep. 27, 1991, abandoned. This application Jun. 2, 1995, Ser. No. 460,359

Int. Cl.[6] **A61K** *31/55;* **C07D** *495/06*

U.S. Cl. 514—214 **1 Claim**

1. A method of inhibiting smooth cell proliferation in a patient in need thereof comprising administering to said patient an effective smooth cell proliferation inhibitory amount of a compound of the formula



wherein

B_1 and B_2 are each independently hydrogen; hydroxy; $—OR_2$ wherein R_2 is a C_1–C_4 alkyl or an Ar-Y group wherein Ar is phenyl or napthyl group unsubstituted or substituted with from one to three substituents selected from the group consisting of methylenedioxy, hydroxy, C_1–C_4 alkoxy, fluoro and chloro and Y is a hydrogen or C_1–C_4 alkyl; or, where B_1 and B_2 are attached to adjacent carbon atoms, B_1 and B_2 can be taken together with said adjacent carbons to form a benzene ring or methylenedioxy;

A is a bond, methylene or oxygen, sulfur or NR_4 or $NCOR_5$ wherein R_4 is hydrogen, a C_1–C_4 alkyl or an Ar-Y- group and R_5 is $—CF_3$, a C_1–C_{10} alkyl or an Ar-Y- group;

R_3 is hydrogen or $—CH_2OC(O)C(CH_3)_3$;

R_1 is hydrogen, C_1–C_4 alkyl or $—CH_2OC(O)—C(CH_3)_3$; and

n is an integer 1 to 3.

5,488,048

AMINOACETYLMERCAPTO DERIVATIVES USEFUL AS INHIBITORS OF ENKEPHALINASE AND ACE

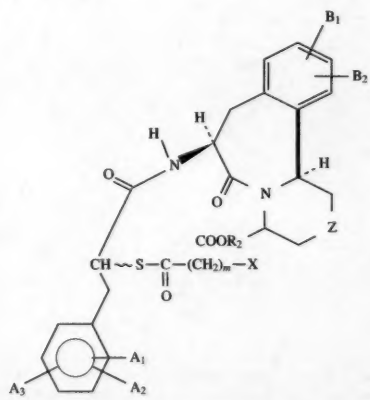
Gary A. Flynn, Cincinnati; Robert J. Cregge, Loveland; Thomas L. Fevig, West Chester; Shyam Sunder, Cincinnati, and Patrick W. Shum, West Chester, all of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 119,924, Sep. 10, 1993, Pat. No. 5,424,425, which is a continuation-in-part of Ser. No. 985,678, Dec. 11, 1992, abandoned, which is a continuation-in-part of Ser. No. 836,028, Feb. 14, 1992, abandoned. This application Mar. 1, 1995, Ser. No. 396,999

Int. Cl.[6] **C07D** *498/04;* **A01K** *31/55*

U.S. Cl. 514—214 **1 Claim**

1. A composition comprising an assayable amount of a compound of the formula



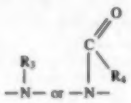
wherein

B_1 and B_2 are each independently hydrogen; hydroxy; $—OR_1$ wherein R_1 is a C_1–C_4 alkyl or an Ar—Y— group wherein Ar ifs phenyl or naphthyl group unsubstituted or substituted with from one to three substituents selected from the group consisting of methylenedioxy, hydroxy, C_1–C_4 alkoxy, fluoro and chloro and Y is a C_0–C_3 alkyl; or, Where B_1 and B_2 are attached to adjacent carbon atoms, B_1 and B_2 can be taken together with said adjacent carbons to form a benzene ring or methylenedioxy;

A_1, A_2 and A_3 are each independently hydrogen; hydroxy; nitro; amino; fluoro, chloro, $—OR_1$ of an Ar—Y group; or, where A_1 and A_2 are attached to adjacent carbon atoms, A_1 and A_2 can be taken together with said adjacent carbons to form a benzene ring or methylenedioxy;

R_2 is hydrogen, a C_1–C_4 alkyl, an Ar—Y— group or $—CH_2O—C(O)(CH_3)_3$;

Z is $—CH_2—$, —O—, —S—,



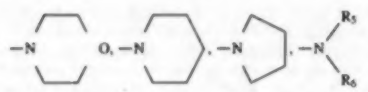
or a bond

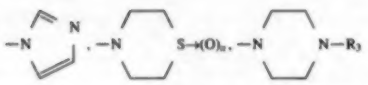
wherein

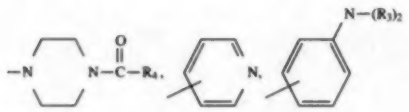
R_3 is hydrogen, a C_1–C_4 alkyl or an Ar—Y— group and R_4 is $—CF_3$, a C_1–C_{10} alkyl or an Ar—Y— group;

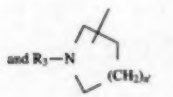
m is an integer 0 to 5;

X is selected from the group consisting of









wherein

R_5 and R_6 are each independently a C_1–C_4 alkyl or an Ar—Y— group and n is an integer 0–2; n' is an integer 1–2; and the pharmaceutically acceptable salts thereof in admixture or otherwise in association with an inert carrier.

5,488,049

METHOD OF TREATING LEARNING AND MEMORY DISORDERS USING BENZOTHIADIAZIDE DERIVATIVES AS NOOTROPIC AGENTS

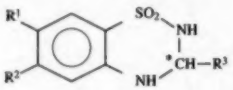
Erminio Costa, Chevy Chase, Md.; Alessandro Guidotti, Washington, D.C.; Mario Baraldi, Modena, Italy; Mariella Bertolino, Washington, D.C.; Maria DiBella, Milan, Italy, and Stefano Vicini, Washington, D.C., assignors to FIDIA - Georgetown Institute for the Neuro-Sciences, Washington, D.C.

Filed Dec. 10, 1993, Ser. No. 164,943

Int. Cl.[6] A61K *31/505*

U.S. Cl. 514—223.2 **13 Claims**

11. A method of treating memory disorders and learning disorders which comprises administering to a mammal a need of treatment an effective amount to treat learning disorders or memory disorders of a (+) enantiomer of a compound having the formula:



wherein * indicates the chiral carbon atom;

R^1 is H or halogen, or SO_2NH_2;

R^2 is H or halogen;

R^3 is C_1–C_8 straight or branched alkyl,

C_2–C_8 straight or branched alkenyl,

C_2–C_8 straight or branched alkynyl,

C_1–C_8 straight or branched alkyl, substituted with a halogen, NH_2, N-C_1–C_4-alkyl substituted amine, N,N'-C_1–C_4-alkyl disubstituted amine, C_1–C_4-alkoxy group, C_1–C_4-thioalkyl group, a C_3–C_6 cycloalkyl group, C_3–C_6 cycloalkenyl group, a C_6–C_8-bicycloalkyl or a C_6–C_8 bicycloalkenyl group,

C_2–C_8 straight or branched alkenyl group substituted with a halogen, NH_2, N-C_1–C_4-alkyl substituted amine, N,N'-C_1–C_4-alkyl disubstituted amine, C_1–C_4-alkoxy group, C_1–C_4-thioalkyl group, a C_3–C_6 cycloalkyl group, C_3–C_6 cycloalkenyl group, a C_6–C_8-bicycloalkyl or a C_6–C_8 bicycloalkenyl group,

C_2–C_8 straight or branched alkynyl group substituted with a halogen, NH_2, N-C_1–C_4-alkyl substituted amine, N,N'-C_1–C_4-alkyl disubstituted amine, C_1–C_4-alkoxy group, C_1–C_4-thioalkyl group, a C_3–C_6 cycloalkyl group, a C_3–C_6 cycloalkenyl group, a C_6–C_8-bicycloalkyl, or a C_6–C_8 bicycloalkenyl group,

C_3–C_6 cycloalkyl,

C_3–C_6 cycloalkenyl,

C_6–C_8 bicycloalkyl, or

C_6–C_8 bicycloalkenyl;

with the proviso that when R^1 is SO_2NH_2 and R^2 is halogen, R^3 is not C_6–C_8 bicycloalkenyl; or a pharmaceutically acceptable salt thereof.

5,488,050

METHODS AND PRODUCTS FOR TREATING PRESBYOPIA

Arthur H. Neufeld, Andover, Mass., assignor to Telor Ophthalmic Pharmaceuticals, Inc., Woburn, Mass.

Continuation of Ser. No. 907,875, Jul. 2, 1992, abandoned. This application Nov. 18, 1993, Ser. No. 154,396

Int. Cl.[6] A61K *31/535;31/47;31/41;31/425*

U.S. Cl. 514—236.2 **64 Claims**

1. A method for increasing the accommodative ability of a presbyopic subject, comprising administering to the subject a beta-adrenergic antagonist in an amount sufficient to increase the accommodative ability of the subject by at least 0.5 diopters.

5,488,051

SUBSTITUTED 5,6-DIHYDRO-5-OXO-1,4-DITHIINO-(2,3-D)-PYRIDAZINE-2,3-DICARBONITRILES, COMPOSITIONS CONTAINING THEM AND THEIR USE AS ANTIMICROBIALS

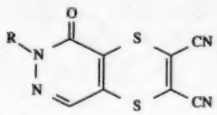
Duane R. Romer; R. Garth Pews; Ravi B. Shankar, all of Midland, and Charles A. Wilson, Skandia, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 21, 1994, Ser. No. 230,590

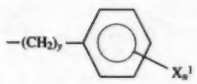
Int. Cl.[6] A61K *31/50;* **C07D** *495/04*

U.S. Cl. 514—248 **11 Claims**

1. A compound corresponding to the formula:

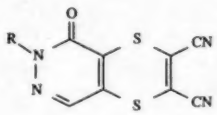


wherein R represents

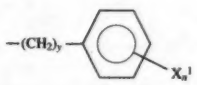


wherein X^1 is Cl, Br, NO_2 or CH_3, y is 0 or 1 and n is 0, 1 or 2.

6. A method for inhibiting microorganisms from the group consisting of bacteria, yeast, fungi, algae, and protozoa in a microbial habitat comprising contacting said microbial habitat with an antimicrobially-effective amount of a compound corresponding to the formula:

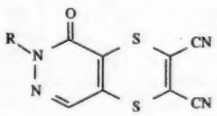


wherein R represents

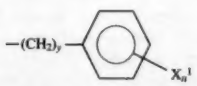


wherein X^1 is Cl, Br, NO_2 or CH_3, y is 0 or 1 and n is 0, 1 or 2.

9. A method for preventing the growth of marine organisms on a surface exposed to a marine environment in which marine organisms grow comprising contacting said surface with a marine antifouling effective amount of a compound corresponding to the formula:



wherein R represents



wherein X^1 is Cl, Br, NO_2 or CH_3, y is 0 or 1 and n is 0, 1 or 2.

5,488,052

AQUEOUS FLOWABLE FENAZAQUIN COMPOSITION COMPRISING SODIUM NAPHTHALENE FORMALDEHYDE CONDENSATES

Larry B. Rowland, New Palestine, and Joseph R. Winkle, Cumberland, both of Ind., assignors to DowElanco, Indianapolis, Ind.

Continuation of Ser. No. 890,500, May 28, 1992. This application Mar. 24, 1995, Ser. No. 410,553

Int. Cl.[6] A01N *43/54;43/78;25/22;25/30*

U.S. Cl. 514—259 **6 Claims**

1. An aqueous flowable composition comprising by % weight:
(a) 15%–20% fenazaquin,
(b) 0.5%–2% one or more surfactants,
(c) 0.02%–1.0% one or more suspending agents,
(d) 0–10% one or more anticaking or flow aids,
(e) 6%–12% one or more dispersants which are sodium naphthalene formaldehyde condensates,
(f) 0–0.5% one or more defoamers,
(g) 4%–8% one or more freeze point depressants,
(h) 0–0.2% one or more antimicrobial agents, and
(i) 50%–80% water.

5,488,053

TETRAHYDRO-PYRIDO-INDOLE

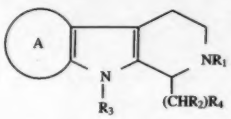
James E. Audia; James J. Droste, both of Indianapolis, Ind., and Deborah A. Evrard, Cambridge, Mass., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 48,392, Apr. 14, 1993, Pat. No. 5,300,645. This application Mar. 11, 1994, Ser. No. 206,830

Int. Cl.[6] A61K *31/44;* **C07D** *471/04*

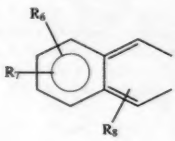
U.S. Cl. 514—280 **14 Claims**

1. A compound of the formula (I)



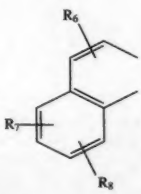
(I)

wherein:
R_1 is hydrogen or C_1–C_3 alkyl;
R_2 is hydrogen or C_1–C_6 alkyl;
R_3 is hydrogen or C_1–C_3 alkyl;
R_4 is an optionally substituted bicyclic hydrocarbon ring system having 7 to 12 carbon atoms and 0, 1, 2 or 4 double bonds;
A is selected from the group consisting of



(II)

and



(III)

wherein
R_8 is independently selected from the group consisting of an R_6 group, substituted C_3–C_8 cycloalkyl, C_3–C_8 cycloalkyl, C_3–C_8

cycloalkyl-(C_1–C_3)alkyl, C_5–C_8 cycloalkenyl, substituted C_5–C_8 cycloalkenyl, C_5–C_8 cycloalkenyl-(C_1–C_3)alkyl, C_7–C_{16} arylalkyl; and

R_6 and R_7 together with the carbon atoms of group A form a 5- to 8-member carbon ring; or

a pharmaceutically acceptable salt or solvate thereof.

5,488,054

CARBAMATES OF RAPAMYCIN

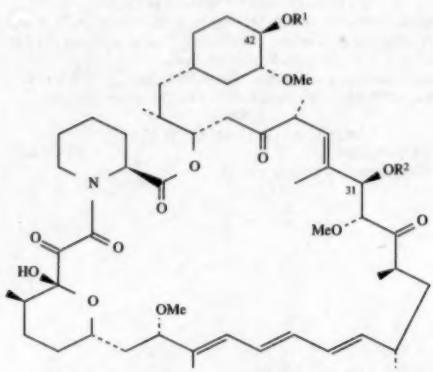
Amedeo A. Failli, Princeton Junction, N.J.; Oleg J. Bleyman, Holland, Pa.; Wenling Kao, Paoli, Pa., and Magid A. Abou-Charbia, Glen Mills, Pa., assignors to American Home Products Corporation, Madison, N.J.

Division of Ser. No. 284,765, Aug. 2, 1994, which is a continuation-in-part of Ser. No. 160,984, Dec. 1, 1993, abandoned, which is a division of Ser. No. 54,655, Apr. 23, 1993, Pat. No. 5,302,584, which is a continuation-in-part of Ser. No. 960,597, Oct. 13, 1992, abandoned. This application May 24, 1995, Ser. No. 448,715

Int. Cl.[6] C02D *49/06;* **A61K** *31/395*

U.S. Cl. 514—291 **1 Claim**

1. A method of treating restenosis in a mammal in need thereof, which comprises administering to said mammal an antiproliferative effective amount of a compound of the structure



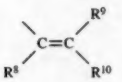
wherein R^1 and R^2 are each, independently, hydrogen, or —CONH—O—$(CR^3R^4)_mZ$;

R^3 and R^4 are each, independently, hydrogen, alkyl of 1–6 carbon atoms, cycloalkyl of 3–8 carbon atoms, —CF_3, or F;

Z is hydrogen, alkyl of 1–6 carbon atoms, —OR^5, —SR^5, —NR^5R^6, —CN, —CF_3, —OAr, —Ar, or R^7;

R^5 and R^6 are each, independently, hydrogen, alkyl of 1–6 carbon atoms, arylalkyl of 4–10 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, alkoxyalkyl of 2–12 carbon atoms, alkylthioalkyl of 2–12 carbon atoms, alkylaminoalkyl of 2–12 carbon atoms, dialkylaminoalkyl of 3–12 carbon atoms, cycloalkyl of 3–8 carbon atoms, or Ar;

R^7 is



or —C≡C—R^{11};

R^8, R^9, R^{10}, and R^{11} are each, independently, hydrogen, alkyl of 1–6 carbon atoms, halogen, or phenyl, wherein the phenyl group may be optionally mono-, di-, or tri-substituted with a group selected from alkyl of 1–6 carbon atoms, arylalkyl of 7–10 carbon atoms, alkoxy of 1–6 carbon atoms, cyano, halo, hydroxy, nitro, carbalkoxy of 2–7 carbon atoms, trifluoromethyl, trifluoroalkoxy of 2–7 carbon atoms, amino, dialkylamino of 1–6 carbon atoms per alkyl group, dialkylaminoalkyl of 3–12 carbon atoms, hydroxyalkyl of 1–6 carbon atoms, alkoxyalkyl of 2–12 carbon atoms, alkylthio of 1–6 carbon atoms, —SO_3H, —PO_3H, and —CO_2H;

Ar is an aryl radical that may be optionally mono-, di-, or tri-substituted with a group selected from alkyl of 1–6 carbon atoms, arylalkyl of 7–10 carbon atoms, alkoxy of 1–6 carbon atoms, cyano, halo, hydroxy, nitro, carbalkoxy of 2–7 carbon atoms, trifluoromethyl, trifluoroalkoxy of 2–7 carbon atoms, amino, dialkylamino of 1–6 carbon atoms per alkyl group, dialkylaminoalkyl of 3–12 carbon atoms, hydroxyalkyl of 1–6 carbon atoms, alkoxyalkyl of 2–12 carbon atoms, alkylthio of 1–6 carbon atoms, —SO_3H, —PO_3H, and —CO_2H; and

m=1–6;

with the proviso that R^1 and R^2 are both not hydrogen, or a pharmaceutically acceptable salt thereof.

5,488,055

SUBSTITUTED N-CYCLOALKYLMETHYL-1H-PYRAZOLO(3,4-B)QUINOLIN-4 AMINES AND COMPOSITIONS AND METHODS OF USE THEREOF

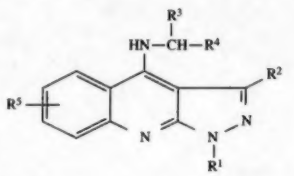
Virendra Kumar, Paoli, Pa., and John A. Dority, Jr., West Haven, Conn., assignors to Sanofi Winthrop Inc., New York, N.Y.

Filed Mar. 10, 1995, Ser. No. 402,269

Int. Cl.[6] C07D *471/04;* **A61K** *31/47*

U.S. Cl. 514—293 **54 Claims**

1. A compound of the formula:



wherein:

R^1 is lower-alkyl, phenyl-lower-alkyl, or cycloalkyl;

R^2 is hydrogen, or lower-alkyl;

R^3 is hydrogen, lower-alkyl, or hydroxylower-alkyl;

R^4 is cycloalkyl or cylcoalkyl substituted by from one to two, the same or different, substituents selected from the group consisting of lower-alkoxycarbonyl, carboxy, lower-alkylthio-lower-alkoxycarbonyl, hydroxylower-alkyl, hydroxy, oxo, lower-alkoxy, lower-alkyl, and halogen; and

R^5 is from one to three, the same or different, substituents selected from the group consisting of hydrogen, lower-alkoxy, hydroxy, dilower-alkylamino-lower-alkoxy, carboxylower-alkoxy, lower-alkoxycarbonyl-lower-alkoxy, nitro, polyhydroxylower-alkoxy, amino, epoxylower-alkoxy, carboxy, lower-alkanoylamino, lower-alkoxycarbonyl, pyridinyl, 4-morpholinyl-lower-alkoxy, lower-alkylsulfonyl, cyano, 1-imidazolyl, halogen, dilower-alkylaminosulfonyl, oxadiazolyl (or oxadiazolyl substituted on any available carbon atom thereof by lower-alkyl), lower-alkylsulfinyl, 1-pyrazolyl (or 1-pyrazolyl substituted on any available carbon atom thereof by lower-alkyl), trifluoromethylsulfonyl, lower-alkenyl, lower-alkyl, and lower-alkynyl; or a pharmaceutically acceptable acid-addition salt and/or hydrate and/or solvate thereof, or, where applicable, a stereoisomer or a racemic mixture thereof.

5,488,056

METHOD FOR TREATING ANXIETY

Neil C. Bodick, Indianapolis; Franklin P. Bymaster, Brownsburg; Walter W. Offen, Indianapolis, and Harlan E. Shannon, Carmel, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 31, 1994, Ser. No. 332,186
Int. Cl.[6] A61K *31/44;* **C07D** *453/02*
U.S. Cl. 514—305 **9 Claims**

1. A method for treating anxiety in humans comprising administering to a human in need thereof, an antianxiety dose of a compound selected from the group consisting of:

3-(3-methoxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-ethoxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-propoxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-butoxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-isopropoxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-cyclopropylmethoxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methyl pyridine
3-(3-pentoxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-isobutoxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(3-butenoxy)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(but-2-ynoxy)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(3-methylbutoxy)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-hexyloxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(prop-2-ynoxy)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-benzyloxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-chloro- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-chloro- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydropyridine
3-(3-butoxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydropyridine
3-(3-ethoxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-ethylpyridine
3-(3-chloro- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-ethylpyridine
3-(3-methoxyethoxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-heptyloxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(3-pentynyloxy)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(4-pentenyloxy)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(2-propenyloxy)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-octyloxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(3-hexynyloxy)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(3-butenyl-2-oxy)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methyl-pyridine
3-(3-(4-hexenyloxy(- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(3-hexenyloxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(2-pentenyloxy)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(2-hexenyloxy)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(5-hexenyloxy)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(3-hexenyloxy)- 1,2,5-thiadiazol-4-yl)-1,2,4,5 -tetrahydro-1-methylpyridine
3-(1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(4-methylpiperidino- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-morpholino- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-dimethylamino- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-hexylamino- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-hexyloxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-deuteromethylpyridine
1,2,5,6-tetrahydro-3-(3-hexyloxy- 1,2,5-thiadiazol-4-yl)-pyridine
3-(3-(2-(2-methoxyethoxy)-ethoxy)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(3-ethoxy-1-propoxy)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(2-ethoxyethoxy)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(2-butoxyethoxy)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(2-(2-butoxyethoxy)-ethoxy)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(2-(2-ethoxyethoxy)-ethoxy)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-butylthio- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-methylthio- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-pentyl- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-propylthio- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-hexylthio- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-pentylthio- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-ethylthio- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-octylthio- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-propyl- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-heptyl- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(5-hexenyl)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-octyl- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(2-methyl)-butyl- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-methylcyclopropyl- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-cyclopentylthio- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(1-ethylthio-2-methoxy)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(3-chloro-1-propylthio)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(2-methoxyethoxy)-ethylthio)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(3-cyano-1-propylthio)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-benzylthio- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(2-ethoxy-1-ethylthio)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(4-pentynylthio)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(2-(2-ethoxymethoxy)-ethylthio)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine

3-(3-(5-cyano-1-pentylthio)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(3-phenyl-1-propylthio)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(2-phenoxyethylthio)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(4-cyanobutylthio)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(2-ethylbutylthio)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-cyclohexylmethylthio- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(8-hydroxyoctylthio)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(7-octenylthio)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(cyclopropylmethylthio- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3(3-cyclopropylmethylthio)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(3-butenylthio)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(4-pentenylthio)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(4-isohexyloxy- 1,2,5-thiadiazol-3-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
1-methyl-1,2,5,6-tetrahydro-3-((4 -cyclopentylpropyl)oxy)- 1,2,5-thiadiazol-3-yl)pyridine
1-methyl-1,2,5,6-tetrahydro-3-(4-isoheptyloxy- 1,2,5-thiadiazol-3-yl)pyridine
1-methyl-1,2,5,6-tetrahydro-3-(4((2 -cyclohexylethyl)oxy)- 1,2,5-thiadiazol-3-yl)pyridine maleate
1,2,5,6-tetrahydro-1-methyl-3 -(4-(1-methylhexyloxy)- 1,2,5-thiadiazol-3-yl)pyridine
3-(4-(1-ethylpentyloxy)- 1,2,5-thiadiazol-3-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(4-(1-ethylbutoxy)- 1,2,5-thiadiazol-3-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
1,2,5,6-tetrahydro-1-methyl-3-(4 -(1-methylpentyloxy)- 1,2,5-thiadiazol-3-yl)pyridine
1-methyl-3-(4-(5-hexenyloxy)- 1,2,5-thiadiazol-3-yl)-1,2,5,6 -tetrahydropyridine
1,2,5,6-tetrahydro-1-methyl-3-(4-(2 -methylbutoxy)- 1,2,5-thiadiazol-3-yl)pyridine
1,2,5,6-tetrahydro-1-methyl-3-(4-(2 -methylpentyloxy)- 1,2,5-thiadiazol-3-yl)pyridine
1,2,5,6-tetrahydro-1-methyl-3-(4-(2,2,2 -trifluoroethoxy)- 1,2,5-thiadiazol-3-yl)pyridine
1-methyl-1,2,5,6-tetrahydro-3-(4-(3 -methylpentyloxy)- 1,2,5-thiadiazol-3-yl)pyridine
3-(3-(3-methyl-2-butenyloxy)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-isobutoxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
1,2,5,6-tetrahydro-1-methyl-3-(4-(2 -methylbutoxy)- 1,2,5-thiadiazol-3-yl)pyridine
3-(3-chloro- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.2)octane
6-(3-chloro- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(3.2.1)octane
3-(3-ethoxy- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.2)octane
3-(3-propoxy- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.2)octane
3-(3-butylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.2)octane
3-(3-pentylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.2)octane
6-(3-ethylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(3.2.1)octane
6-(3-butylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(3.2.1)octane
3-(3-(3-hydroxypropoxy)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-butoxy- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.2)octane
1,6-dimethyl-3-(3-hexyloxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydropyridine
3-(3-(3-phenyl-ethylthio)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-propylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.1)heptane
3-(3-ethylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.2)octane
3-(3-butylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.2)heptane
3-(3-butylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.2)heptane
3-(3-ethylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.2)octane
3-(3-propylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.2)octane
4-chloro-3-(3-propyloxy- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(3.3.1)non-2-ene
3-(3-isopentyloxy- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.2)octane
3-(3-propylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(3.2.1)octane
bis-1,4-(3-(1-methyl-1,2,5,6 -tetrahydropyridin-3-yl)- 1,2,5-thiadiazol-4-yl)butanedithiol
3-(3-propylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(3.2.1)octane
3-(3-(4,4,4-trifluorobutoxy)- 1,2,5-thiadiazol-4-yl)-1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(3,3,3-trifluoropropylthio)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-propylthio- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydropyridine
3-(3-butylthio- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydropyridine
3-(3-butylthio- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1,1-dimethylpyridinium iodide
3-(3-butylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.2)octane
1,6-dimethyl-3-(3-butoxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydropyridine
3-(3-(3-methyl-2-butenyloxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methyl pyridine
3-(3-isobutoxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
1,2,5,6-tetrahydro-1-methyl-3-(4 -(2-methylbutoxy)- 1,2,5-thiadiazol-3-yl)pyridine
3-(3-chloro- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.1)octane
6-(3-chloro- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(3.2.1)octane
3-(3-ethoxy- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.2)octane
3-(3-propoxy- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.2)octane
3-(3-butylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.2)octane
3-(3-pentylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.2)octane
6-(3-ethylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(3.2.1)octane
6-(3-butylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(3.2.1)octane
3-(3-(3-hydroxypropoxy)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(butoxy- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.2)octane
1,6-dimethyl-3-(3-hexyloxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydropyridine
3-(3-(3phenyl-ethylthio- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-propylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.1)heptane
3-(3-ethylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.2)octane
3-(3-butylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.1)heptane
3-(3-butylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.1)heptane
3-(3-ethylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.2)octane
3-(3-propylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.2)octane
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3-(3-propylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(3.2.1)octane
bis-1,4-(3-(1-methyl-1,2,5,6-tetrahydropyridin- 3-yl)- 1,2,5-thiadiazol-4-yl)butanedithiol
3-(3-propylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(3.2.1)octane
3-(3-(4,4,4-trifluorobutoxy)- 1,2,5-thiadiazol-4-yl)-1,2,5-thiodiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-(3,3,3-trifluoropropylthio)- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-propylthio- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1-methylpyridine
3-(3-propylthio- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydropyridine
3-(3-butylthio- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydropyridine
3-(3-butylthio- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydro-1,1-dimethylpyridinium iodide
3-(3-butylthio- 1,2,5-thiadiazol-4-yl)-1 -azabicyclo(2.2.2.)octane
1,6-dimethyl-3-(3-butylthio- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydropyridine
1,6-dimethyl-3-(3-butoxy- 1,2,5-thiadiazol-4-yl)-1,2,5,6 -tetrahydropyridine; or a pharmaceutically acceptable salt thereof.

5,488,057

2-OXINDOLE COMPOUNDS WHICH HAVE USEFUL TYROSINE KINASE ACTIVITY

Franco Buzzetti, Monza (Milan); Antonio Longo, Milan, and Maristella Colombo, Cesano Boscone (Milan), all of, Italy, assignors to Farmitalia Carlo Erba S.r.l., Milan, Italy

Division of Ser. No. 126,687, Sep. 27, 1993, Pat. No. 5,374,652, which is a continuation of Ser. No. 768,259, Oct. 28, 1991, abandoned. This application Aug. 23, 1994, Ser. No. 294,350

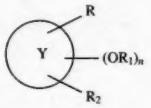
Claims priority, application United Kingdom, Feb. 28, 1990, 9004483

Int. Cl.[6] C07D *401/06;* **A61K** *31/47;31/405*

U.S. Cl. 514—312 **6 Claims**

6. A method of treating a patient in need of a tyrosine kinase inhibitor, comprising the step of:

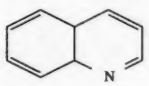
administering to said patient, in an amount effective to inhibit tyrosine kinase, a compound of formula (I)



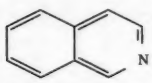
(I)

wherein

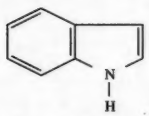
Y is a bicyclic ring system selected from the group consisting of (E), (F) and (G):



(E)

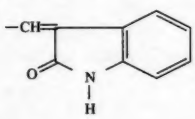


(F)



(G)

and R is a group of formula (e)



(e)

n is zero, 1 or 2;

R_1 is hydrogen, C_1–C_6 alkyl or C_2–C_{61} alkanoyl;

or a pharmaceutically acceptable salt thereof; and wherein each of the substituents R, OR_1 and R_2 may be on either the aryl or the heteroaryl moiety of the bicyclic ring systems (E), (F) and (G).

5,488,058

BENZOTHIOPHENE COMPOUNDS, INTERMEDIATES, COMPOSITIONS, AND METHOD FOR INHIBITING RESTENOSIS

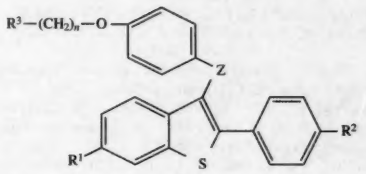
Alan D. Palkowitz, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 396,401, Feb. 28, 1995. This application Jun. 6, 1995, Ser. No. 469,983

Int. Cl.[6] A61K *31/445;31/535;31/55;31/40*

U.S. Cl. 514—324 **1 Claim**

1. A method for inhibiting restenosis comprising administering to a human in need of treatment an effective amount of a compound of formula I



I

wherein

R^1 is —H, —OH, —O(C_1–C_4 alkyl), —OCOC_6H_5, —OCO(C_1–C_6 alkyl), or —OSO_2(C_2–C_6 alkyl);

R^2 is —H, —OH, —O(C_1–C_4 alkyl), —OCOC_6H_5, —OCO(C_1–C_6 alkyl), —OSO_2(C_2–C_6 alkyl), or halo, providing when Z is —S—, R^2 is not halo;

R^3 is 1-piperidinyl, 1-pyrrolidinyl, methyl-1-pyrrolidinyl, dimethyl-1-pyrrolidinyl, 4-morpholino, dimethylamino, diethylamino, diisopropylamino, or 1-hexamethyleneimino;

n is 2 or 3; and

z is —O— or —S—;

or a pharmaceutically acceptable salt thereof.

5,488,059

TREATMENT OF ERECTILE DYSFUNCTION

Allen E. Buhl, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 816,700, Dec. 23, 1991, abandoned. This application May 27, 1994, Ser. No. 250,193

Int. Cl.[6] A61K *31/44;31/155*

U.S. Cl. 514—349 **2 Claims**

1. A method for inducing or enhancing an erection in mammals comprising the administration of an amount of from 0.5 μg to 1000 μg of N-cyano-N'(1,1-dimethyl propyl)-N"-3-pyridinyl guanidine or a pharmaceutically acceptable salt thereof to the penis of said mammal.

5,488,060

SUBSTITUTED THIADIAZOLES, COMPOSITIONS CONTAINING THEM AND THEIR USE AS ANTIMICROBIAL AND MARINE ANTIFOULING AGENTS

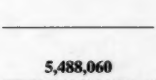
Ravi B. Shanker; Duane R. Romer, and R. Garth Pews, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 21, 1994, Ser. No. 360,496

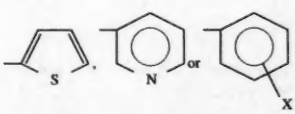
Int. Cl.[6] A61K *31/41;* **A01N** *43/832;* **C07D** *285/10;417/04*

U.S. Cl. 514—362 **24 Claims**

1. A compound corresponding to the formula:



wherein R represents



X represents H, —Br, —Cl, —F, —CH_3, —OCH_3, —$COOCH_3$, —NO_2, —SCH_3, —SO_2CH_3 or —CF_3 and Y is —SCN or —SCH_2SCN.

5,488,061

1-ALKYL-, 1-ALKENYL-, AND 1-ALKYNYLARYL-2-AMINO-1,3-PROPANEDIOLS AND RELATED COMPOUNDS

John J. Tegeler, Bridgewater; Barbara S. Rauckman, Flemington; Russell R. L. Harmer, Lebanon; Brian S. Freed, Phillipsburg, all of N.J., and Gregory H. Merriman, Fairfield, Ohio, assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 942,908, Sep. 10, 1992, Pat. No. 5,360,811, which is a continuation-in-part of Ser. No. 840,236, Feb. 24, 1992, which is a continuation of Ser. No. 632,910, Dec. 24, 1990, abandoned, which is a continuation-in-part of Ser. No. 596,448, Oct. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 492,200, Mar. 13, 1990, abandoned. This application May 23, 1994, Ser. No. 247,739

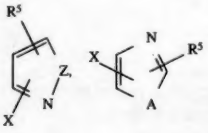
Int. Cl.[6] A61K *31/425;31/42;* **C07D** *277/02;263/02*

U.S. Cl. 514—372 **13 Claims**

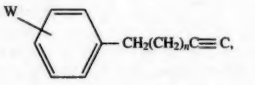
1. A compound of the formula

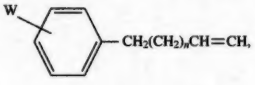
$$RCH(OR^1)CH(NR^2R^3)R^4 \text{ or } RCH_2CR^{35}(NR^2R^3)R^4$$

wherein R is

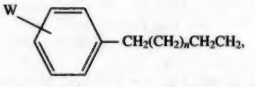


wherein R^5 is $CH_3(CH_2)_mC{\equiv}C$, $CH_3(CH_2)_mCH{=}CH$, $CH_3(CH_2)_mCH_2CH_2$,





or



$CH_2(CH_2)_mCH_2C(=O)$, $CH_3(CH_2)_mCH_2O$,

or

$CH_3(CH_2)_mC(=O)$

wherein m is 3 to 15, n is 0 to 12, and W and X are independently hydrogen, hydroxy, loweralkyl, loweralkoxy, halogen, or trifluoromethyl, or

$OCN(R^{23})_2$

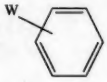
wherein R^{23} is loweralkyl; Z is S, O or C=O; and A is S or O; R^1 is hydrogen, loweralkyl,

$C(=O)NHR^{24}$

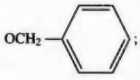
wherein R^{24} is loweralkyl or

$CR^6(=O)$

wherein R^6 is hydrogen, loweralkyl, loweralkoxy, $N(R^{21})_2$ wherein R^{21} is hydrogen, loweralkyl, or



wherein W is as above, or



R^2 is hydrogen or loweralkyl; R^3 is hydrogen, loweralkyl or

$CR^6(=O)$

wherein R^6 is as above or NHR^{27} wherein R^{27} is loweralkyl; R^{35} is

COR^{36}

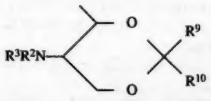
wherein R^{36} is loweralkyl; R^4 is

COR^7

wherein R^7 is hydrogen or loweralkyl, $C(R^{25})_2OR^8$ wherein R^8 is hydrogen, loweralkyl, or

$CR^6(=O)$

wherein R^6 is as above and R^{25} is hydrogen or loweralkyl; R^1 and R^8 taken together with the oxygen to which they are attached form a group of the formula



wherein R^9 and R^{10} are independently hydrogen or loweralkyl; or the pharmaceutically acceptable salts thereof.

5,488,062

2-SACCHARINYLMETHYL HETEROCYCLIC CARBOXYLATES USEFUL AS PROTEOLYTIC ENZYME INHIBITORS AND COMPOSITIONS AND METHOD OF USE THEREOF

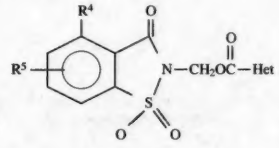
Richard P. Dunlap, Penfield; Dennis J. Hlasta, Clifton Park; Ranjit C. Desai, Colonie; Lee H. Latimer, Brighton; Chakrapani Subramanyam, East Greenbush; John J. Court, Colonie; Malcolm R. Bell, East Greenbush, and Virendra Kumar, Colonie, all of N.Y., assignors to Sterling Winthrop Inc., New York, N.Y.

Division of Ser. No. 109,411, Aug. 19, 1993, Pat. No. 5,376,653, which is a continuation of Ser. No. 816,621, Dec. 30, 1991, abandoned. This application Aug. 9, 1994, Ser. No. 287,681

Int. Cl.[6] A61K *31/425;* **C07D** *417/12*

U.S. Cl. 514—373 **11 Claims**

1. A compound having the formula:



wherein:

Het is thienyl or thienyl substituted by from one to three, the same or different, members of the group consisting of lower-alkyl, perfluorolower-alkyl, lower-alkoxy and halogen;

R^4 is hydrogen, halogen, lower-alkyl, perfluorolower-alkyl, perchlorolower-alkyl, lower-alkenyl, lower-alkynyl, cyano, carboxamido, amino, lower-alkylamino, dilower-alkylamino, lower-alkoxy, benzyloxy, lower-alkoxycarbonyl, hydroxy or phenyl; and

R^5 is hydrogen or from one to two substituents in any of the 5-, 6- or 7-positions selected from halogen, cyano, nitro, N=B', lower-alkyl-2-pyrrolyl, lower-alkylsulfonyl-amino, polyfluorolower-alkylsulfonylamino, polychlorolower-alkylsulfonylamino, aminosulfonyl, lower-alkyl, polyfluoro-lower-alkyl, polychlorolower-alkyl, cycloalkyl, lower-alkoxy, hydroxy, carboxy, carboxamido, hydroxylower-alkyl, methylenedioxy, cycloalkyloxy, formyl, aminomethyl, polyfluorolower-alkylsulfonyl, polychlorolower-alkylsulfonyl, lower-alkylsulfonylaminosulfonyl, di(lower-alkyl)phosphonoxy, lower-alkoxy-poly-lower-alkyleneoxy, hydroxy-lower-alkoxy, polyhydroxy-alkoxy, polyalkoxy-alkoxy, —SR, —SOR, —SO_2R, —OCOR, —O—(C_1–C_{10} alkylene)—COOR, —O—(C_2–C_{10} alkylene)—N=B' where R is lower-alkyl, phenyl, benzyl or naphthyl, or phenyl or naphthyl substituted by from one to two substituents selected from lower-alkyl, lower-alkoxy or halogen and where N=B' is amino, lower-alkylamino, dilower-alkyl-amino, 1-azetidinyl, 1-pyrrolidinyl, 1-piperidinyl, 4-morpholinyl, 1-piperazinyl, 4-lower-alkyl-1-piperazinyl, 4-benzyl-1-piperazinyl, 1-imidazolyl or (carboxy-lower-alkyl)amino; or R^5 is a 5- or 6-membered saturated ring fused to the saccharin ring at the 5,6 or 6,7 positions, said ring containing two heteroatoms chosen from the group consisting of nitrogen, oxygen and sulfur or a methylated derivative of said ring;

or acid-addition salts of basic members thereof or base-addition salts of acidic members thereof.

5,488,063

1-ALKYL-, 1-ALKENYL-, AND 1-ALKYNYLARYL-2-AMINO-1,3-PROPANEDIOLS AND RELATED COMPOUNDS

John J. Tegeler, Bridgewater; Barbara S. Rauckman, Flemington; Russell R. L. Harmer, Lebanon; Brian S. Freed, Phillipsburg, all of N.J., and Gregory H. Merriman, Fairfield, Ohio, assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 942,908, Sep. 10, 1992, Pat. No. 5,360,811, which is a continuation-in-part of Ser. No. 840,236, Feb. 24, 1992, abandoned, which is a continuation of Ser. No. 632,910, Dec. 24, 1990, abandoned, which is a continuation-in-part of Ser. No. 596,448, Oct. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 492,200, Mar. 13, 1990, abandoned. This application May 23, 1994, Ser. No. 247,368

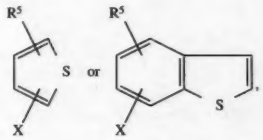
Int. Cl.[6] A61K *31/38;* **C07D** *333/20*

U.S. Cl. 514—438 **93 Claims**

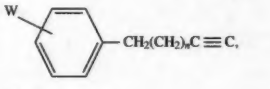
1. A compound of the formula

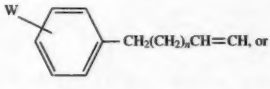
$$RCH(OR^1)CH(NR^2R^3)R^4 \text{ or } RCH_2CR^{35}(NR^2R^3)R^4$$

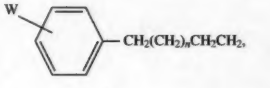
wherein R is

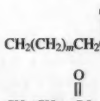


wherein R^5 is $CH_3(CH_2)_mC{\equiv}C$, $CH_3(CH_2)_mCH{=}CH$, $CH_3(CH_2)_mCH_2CH_2$,







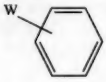


wherein m is 3 to 15, n is 0 to 12, and W and X are independently hydrogen, hydroxy, loweralkyl, loweralkoxy, halogen, or trifluoromethyl, or

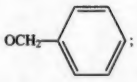
wherein R^{23} is loweralkyl; R^1 is hydrogen, loweralkyl, $Si(R^{23})_2C(R^{23})$, wherein R^{23} is loweralkyl

wherein R^{24} is loweralkyl or

wherein R^6 is hydrogen, loweralkyl, loweralkoxy, $N(R^{21})_2$ wherein R^{21} is hydrogen, loweralkyl, or



wherein W is as above, or



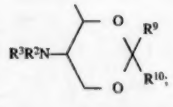
R^2 is hydrogen or loweralkyl; R^3 is hydrogen, loweralkyl or

wherein R^6 is as above or NHR^{27} wherein R^{27} is loweralkyl; R^{35} is

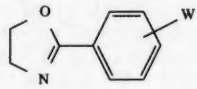
wherein R^{36} is loweralkyl; R^4 is

wherein R^7 is hydrogen or loweralkyl, $C(R^{25})_2OR^8$ wherein R^8 is hydrogen, loweralkyl, or

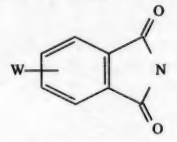
wherein R^6 is as above and R^{25} is hydrogen or loweralkyl; R^1 and R^8 taken together with the oxygen to which they are attached form a group of the formula



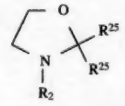
wherein R^9 and R^{10} are independently hydrogen or loweralkyl; R^2, R^3 and R^4 taken together with the nitrogen and oxygen to which they are attached form a group of the formula



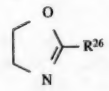
wherein W is as above; R^2 and R^3 taken together with the nitrogen atom to which it is attached form a group of the formula



wherein W is as above; R^3 and R^4 taken together with the nitrogen and oxygen atoms to which they are attached form a group of the formula



wherein R^2 is as above and R^{25} is loweralkyl; R^1, R^2 and R^3 taken together with the nitrogen and oxygen atoms to which they are attached form a group of the formula



wherein R^{26} is loweralkyl; the optical isomers thereof, or the pharmaceutically acceptable salts thereof.

5,488,064

BENZO 1,3 DIOXOLE DERIVATIVES

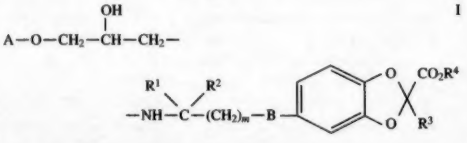
Philip M. Sher, Plainsboro, N.J., assignor to Bristol-Myers Squibb Company, Princeton, N.J.

Filed May 2, 1994, Ser. No. 236,738

Int. Cl.[6] A61K *31/36;* **C07D** *317/68;405/12*

U.S. Cl. 514—465 **18 Claims**

1. A compound of the formula



I

or pharmaceutically acceptable salts thereof where A is phenyl, naphthyl or dihydro- or tetrahydronaphthyl optionally substituted on the aromatic ring by one to three substituents independently selected from halogen, cyano, trifluoromethyl, nitro, alkoxy, alkylsulfonyl, alkyl, cycloalkyl, aryl or a hydrogen bond donor;

B is a bond or an oxygen atom;

R^1 and R^2 are independently hydrogen or lower alkyl;

R^3 is hydrogen, lower alkyl or CO_2R^4;

R^4 is hydrogen or lower alkyl;

m is an integer of 1 or 2; wherein aryl is phenyl or naphthyl optionally substituted with one to three substituents selected from lower alkyl or halogen and a hydrogen bond donor is

hydroxyl, amino, aminocarbonyl, hydroxymethyl, alkylsulfonylamino, acylamino and divalent substituents that render A a benzoheterocycle selected from indole, benzimidazole, benzotriazole, benzimidazol-2-one, or quinoxaline-2,3-diol.

5,488,065

ANTIMICROBIAL COMPOSITIONS

Willy Roth, 24 Hardstrasse, Strengelbach, Switzerland

Continuation of Ser. No. 670,246, Nov. 13, 1984, abandoned. This application Apr. 28, 1986, Ser. No. 859,189

Claims priority, application Switzerland, Nov. 17, 1983, 6184/83

Int. Cl.[6] A61K *31/285*

U.S. Cl. 514—504 **9 Claims**

1. An antimicrobial composition which is suitable for antimicrobial finishing of synthetic plastic materials, comprising 10,10'-oxybisphenoxarsine as the antimicrobial agent, benzyl alcohol solvent, and a plasticizer comprising an ester of a polybasic acid, wherein Said agent is present in the amount of from about 1% to about 2% by weight of said agent plus said solvent and plasticizer, and from about 10% to about 50% by weight of said agent plus said solvent.

5,488,066

ALKYLAMINOALKYL-TERMINATED SULFIDE/SULFONYL-CONTAINING CYCLOALKYL-ALANINE AMINO-DIOL COMPOUNDS FOR TREATMENT OF HYPERTENSION

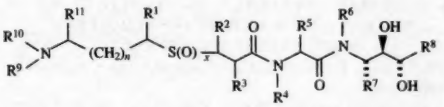
Barbara B. Chen, Glenview; Gunnar J. Hanson, Skokie, and John S. Baran, Winnetka, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 141,771, Oct. 25, 1993, Pat. No. 5,416,119. This application Jan. 23, 1995, Ser. No. 376,617

Int. Cl.[6] A61K *31/16;31/165*

U.S. Cl. 514—618 **8 Claims**

1. A therapeutic method for treating hypertension said method comprising administering to a hypertensive patient a therapeutically-effective amount of a compound of Formula I:



(I)

wherein each of R^1 and R^{11} is a group independently selected from hydrido, alkyl, alkylaminoalkyl and phenyl; wherein n is a number selected from zero through five, inclusive; wherein x is a number selected from zero, one and two; wherein R^2 is selected from hydrido and alkyl; wherein R^3 is a group selected from hydrido, cycloalkylalkyl, aralkyl and haloaralkyl; wherein each of R^4 and R^6 is a group independently selected from hydrido and methyl; wherein R^5 is selected from cycloalkylalkyl groups containing from three to about twelve carbon atoms; wherein R^7 is a group selected from alkyl, cycloalkylalkyl and aralkyl; wherein R^8 is a group selected from hydrido, alkyl, hydroxyalkyl, cycloalkyl, cycloalkylalkyl, alkenyl and haloalkenyl; wherein each of R^9 and R^{10} is a group independently selected from hydrido, alkyl, cycloalkyl, cycloalkylalkyl, alkylacyl, aryl, aralkyl, haloaryl and haloaralkyl; and wherein any one of said R^1 through R^{11} groups having a substitutable position may be substituted with one or more groups selected from alkyl, hydroxy, hydroxyalkyl, halo, alkoxy, alkoxyalkyl and alkenyl; or a pharmaceutically-acceptable salt thereof.

5,488,067

ALKYLAMINOALKYL-TERMINATED SULFIDE/SULFONYL-CONTAINING PROPARGYL AMINO-DIOL COMPOUNDS FOR TREATMENT OF HYPERTENSION

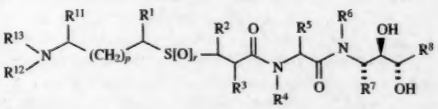
Gunnar J. Hanson, Skokie, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 126,940, Sep. 24, 1993, Pat. No. 5,414,018. This application Jan. 23, 1995, Ser. No. 376,504

Int. Cl.[6] A61K *31/16;31/165*

U.S. Cl. 514—618 **7 Claims**

1. A therapeutic method for treating hypertension, said method comprising administering to a hypertensive patient a therapeutically-effective amount of a compound of Formula I:



(I)

wherein each of R^1 and R^{11} is a group independently selected from hydrido, alkyl, alkylaminoalkyl and phenyl; wherein p is a number selected from zero through five, inclusive; wherein r is a number selected from zero, one and two; wherein R^2 is selected from hydrido and alkyl;

wherein R^3 is a group selected from hydrido, cycloalkylaikyl, aralkyl and haloaralkyl; wherein each of R^4 and R^6 is a group independently selected from hydrido and methyl; wherein R^5 is selected from

wherein V is selected from hydrido, alkyl, cycloalkyl, aryl and aralkyl; wherein each of R^9 and R^{10} is a group independently selected from hydrido, alkyl, alkenyl, alkynyl, cycloalkyl and aryl; wherein m is a number selected from zero through three; wherein n is a number selected from zero through three; wherein R^7 is a group selected from alkyl, cycloalkylalkyl and aralkyl; wherein R^8 is a group selected from hydrido, alkyl, hydroxyalkyl, cycloalkyl, cycloalkylalkyl, alkenyl and haloalkenyl; wherein each of R^{12} and R^{13} is a group independently selected from hydrido, alkyl, cycloalkyl, cycloalkylalkyl, alkylacyl, aryl, aralkyl, haloaryl and haloaralkyl; and wherein any one of said R^1 through R^{13} groups having a substitutable position may be substituted with one or more groups selected from alkyl, hydroxy, hydroxyalkyl, halo, alkoxy, alkoxyalkyl and alkenyl; or a pharmaceutically-acceptable salt thereof.

5,488,068

AMINOBIPHENYL-4-OL ANTI-ATHEROSCLEROTIC COMPOUNDS AND METHOD

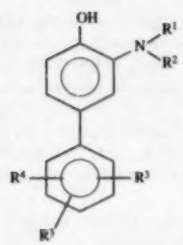
Rex A. Parker, Lawrenceville, and Scott A. Biller, Ewing, both of N.J., assignors to Bristol-Myers Squibb Company, Princeton, N.J.

Filed Aug. 18, 1994, Ser. No. 292,671

Int. Cl.[6] A61K *31/135*

U.S. Cl. 514—647 **6 Claims**

1. A method for treating atherosclerosis, which comprises administering to a patient in need of treatment a therapeutically effective amount of a compound having the structure



wherein R^1 and R^2 independently hydrogen, lower alkyl, or arylalkyl, at least one of R^1 and R^2 being other than hydrogen; and R^3, R^4 and R^5 are independently hydrogen, halo, alkoxy, lower alkyl, lower alkenyl, aryl or arylalkyl; or a pharmaceutically acceptable salt thereof, wherein lower alkyl as employed alone or as part of another group includes both straight and branched chain hydrocarbons optionally substituted with 1 to 4 substituents which are halo, CF_3, alkoxy, aryl, aryloxy, aryl(aryl), diaryl, arylalkyl, arylalkyloxy, alkenyl, cycloalkyl, cycloalkylalkyl, cycloalkylalkyloxy, amino, hydroxy, acyl, heteroaryl, heterparyloxy, heteroarylalkyl, heteroarylalkoxy, aryloxyalkyl, aryloxyaryl, alkylamido, alkanoylamino, arylcarbonylamino, nitro, cyano, thiol and/or alkylthio; aryl as employed herein alone or as part of another group refers to monocyclic and bicyclic aromatic groups which optionally include 1 to 3 additional rings fused to Ar which additional rings include aryl, cycloalkyl, heteroaryl or cycloheteroalkyl rings, and aryl may be optionally substituted through available carbon atoms with 1, 2, or 3 groups selected from hydrogen, halo, alkyl, haloalkyl, alkoxy, haloalkoxy, alkenyl, trifluoromethyl, trifluoromethoxy, alkynyl, cycloalkylalkyl, cycloheteroalkyl, cycloheteroalkylalkyl, aryl, heteroaryl, arylalkyl, aryloxy, aryloxyalkyl, arylalkoxy, arylazo, heteroarylalkyl, heteroarylalkenyl, heteroarylheteroaryl, heteroaryloxy, hydroxy, nitro, cyano, amino; substituted amino wherein the amino includes 1 or 2 substituents which are alkyl, aryl or any of the other aryl compounds mentioned above; thiol, alkylthio, arylthio, heteroarylthio, arylthioalkyl, alkoxyarylthio, alkylcarbonyl, arylcarbonyl, arylaminocarbonyl, alkoxycarbonyl, aminocarbonyl, alkylcarbonyloxy, arylcarbonyloxy, alkylcarbonylamino, arylcarbonylamino, arylsulfinyl, arylsulfinylalkyl, arylsulfonylamino or arylsulfonaminocarbonyl.

5,488,069

OPHTHALMIC PHARMACEUTICAL COMPOSITION CONTAINING N-ACETYL-CYSTEINE AND POLYVINYLALCOHOL

Federico Stroppolo, Pregassona, Switzerland; Daniele Bonaden, Varese, Italy; Francesco Tocchini, Bissone, Switzerland, and Annibale Gazzaniga, Rescaldina, Italy, assignors to Zambon Group S.p.A., Vicenza, Italy

Continuation of Ser. No. 5,397, Jan. 15, 1993, abandoned. This application Jun. 3, 1994, Ser. No. 253,587

Claims priority, application Italy, Jan. 16, 1992, MI92A0074

Int. Cl.[6] A61K *31/195;31/74*

U.S. Cl. 514—772.4 **7 Claims**

1. An ophthalmic pharmaceutical comprising 3–5% weight per volume of N-acetyl-cysteine, and 1–97% weight per volume polyvinylalcohol.

5,488,070

POLYURETHANE-BASED, COMPACT MOLDINGS OR MOLDINGS HAVING A CELLULAR CORE AND A COMPACTED SURFACE, PROCESS FOR THEIR PRODUCTION, AND THEIR USE AS SHOE OR SHOE SOLE MATERIAL

Peter Falke, Schwarzheide; Holger Seifert, Freital, and Marion Heinz, Senftenberg, all of, Germany, assignors to BASF Schwarzheide GmbH, Germany

Filed Feb. 27, 1995, Ser. No. 394,877

Claims priority, application Germany, Feb. 25, 1994, 44 06 219.2

Int. Cl.[6] C08J *9/34*

U.S. Cl. 521—51 **4 Claims**

1. A method of making a shoe or a shoe sole material having a cellular core and a compacted surface, comprising reacting an organic and/or modified polyisocyanate with a polyhydroxyl compound in the presence of a crosslinked poly(meth) acrylic acid, poly(meth) acrylic acid salt, and/or poly(meth) acrylamide.

5,488,071

POLYOXYALKYLENE POLYETHER MONOOL POLYURETHANE FOAM ADDITIVE

Jimmy L. Patterson, New Boston, Mich., assignor to BASF Corporation, Mt. Olive, N.J.

Division of Ser. No. 427,016, Apr. 24, 1995, Pat. No. 5,464,562. This application Aug. 3, 1995, Ser. No. 510,985

Int. Cl.[6] C08G *18/30;18/34;18/36*

U.S. Cl. 521—114 **18 Claims**

1. A rigid closed cell polyisocyanate based foam comprising the reaction between an organic aromatic polyisocyanate and a polyol composition in the presence of a C_4–C_7 aliphatic or cycloaliphatic hydrocarbon blowing agent, said polyol composition comprising:

a) a compound having polyester linkages;

b) a polyoxyalkylene polyether monool initiated with a C_8–C_{24} fatty hydrocarbon having one alkylene oxide active hydrogen atom.

5,488,072

RIGID CLOSED CELL POLYISOCYANATE BASED FOAMS FOR USE AS POSITIVE FLOTATION MATERIALS IN WATERCRAFT

Todd J. Green, Canton, Mich., assignor to BASF Corporation, Mt. Olive, N.J.

Division of Ser. No. 383,627, Feb. 6, 1995, Pat. No. 5,449,699. This application May 15, 1995, Ser. No. 442,237

Int. Cl.[6] C08J *9/14;* **C08G** *18/18*

U.S. Cl. 521—129 **14 Claims**

1. A rigid closed cell polyisocyanate-based foam having a density measured as a free rise of 1.7 pcf to 3.0 pcf comprising reacting an organic diisocyanate or polyisocyanate with a formulated polyol composition, said formulated polyol composition comprising:

a) 1,1,1,2-tetrafluoroethane and

b) a polyol composition comprising:

b1) a compound having at least two isocyanate active hydrogens, said compounds having an average hydroxyl number of less than 400 and an average functionality of greater than 4.0;

b2) water; and,

b3) a catalyst;

wherein the formulated polyol composition is under a pressure sufficient to keep 1,1,1,2-tetrafluoroethane in a liquid state.

5,488,073

AZEOTROPIC COMPOSITIONS OF 1,1,1,4,4,4-HEXAFLUOROBUTANE AND N-PENTANE AND THE USE THEREOF IN THE PRODUCTION OF FOAMS

Joachim Werner, Bethel Park, Pa.; Scott A. Kane, Wellsburg, W. Va.; Herman P. Doerge, Pittsburgh, and Eric F. Boonstra, Oakdale, both of Pa., assignors to Bayer Corporation, Pittsburgh, Pa.

Division of Ser. No. 410,469, Mar. 24, 1995. This application Jun. 1, 1995, Ser. No. 457,244

Int. Cl.[6] C08J *9/14*

U.S. Cl. 521—131 3 Claims

1. A polyurethane foam which has been produced by reacting a polyisocyanate with an isocyanate reactive material in the presence of an azeotropic composition consisting essentially of

a) from about 73 to about 87% by weight of 1,1,1,4,4,4-hexafluorobutane and

b) from about 13 to about 27% by weight of n-pentane.

5,488,074

POLYETHERESTEROLS, THEIR PREPARATION, AND THEIR USE IN POLYURETHANES

Gerd Mueller-Hagen, Ludwigshafen; Horst Heinrich, Ruhland, and Baerbel Meyer, Lauta, all of, Germany, assignors to BASF Schwarzheide GmbH, Germany

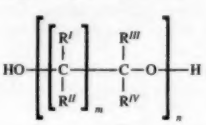
Division of Ser. No. 143,032, Oct. 29, 1993, Pat. No. 5,453,480. This application Jul. 10, 1995, Ser. No. 500,076

Claims priority, application Germany, Dec. 12, 1992, 42 41 415.6

Int. Cl.[6] C08G *18/00*

U.S. Cl. 521—172 9 Claims

1. A polyurethane plastic comprising the reaction product of an isocyanate component with a polyetheresterol, said polyetheresterol comprising the condensation product of a polyfunctional carboxylic acid with alkanediols and etherdiols, said etherdiols corresponding to the formula:



where

m=1 to 3

n≧3 and

R^{I}, R^{II}, R^{III} and R^{IV} are identical or different and, independently of one another, are hydrogen or C_1- to C_4-alkyl,

the ratio between the ether and ester groups in the polyetheresterol being in the range of from 0.3:1 to 1.5:1, and the total amount of —OH groups in the alkanediols and etherdiols to the —COOH groups of the polyfunctional carboxylic acid reacted at a ratio of from 1.01:1 to 1.1:1.

5,488,075

CONTRACEPTIVE FOR USE BY A MALE

Sujoy K. Guha, 9 West Avenue, I.I.T., New Delhi 110016, Ind.

Filed Sep. 20, 1994, Ser. No. 309,135

Int. Cl.[6] C08L *25/08;* C08K *5/41;* A61K *31/74*

U.S. Cl. 522—168 7 Claims

1. A contraceptive for use by a male comprising an injectable fluid of a copolymer of styrene with maleic anhydride in a solvent consisting of dimethylsulphoxide characterized in that said copolymer is prepared by subjecting a mixture of styrene and maleic anhydride to the step of irradiation at a dose of 0.2 to 0.24 megarad for every 40 gms. of said mixture.

5,488,076

WATER ABLATIVE COATING FOR DRAG REDUCTION APPLICATIONS

Robert F. Supcoe, Annapolis, Md., and Francis J. Moran, Jr., Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 8, 1973, Ser. No. 386,658

Int. Cl.[6] B05D *5/08;* C09D *5/14;* B63B *1/34*

U.S. Cl. 523—175 19 Claims

1. A water ablative paint for application to the exterior surface of a waterborne vehicle to reduce drag by reducing turbulence and promoting laminar flow in the boundary layer immediately adjacent the vehicle surface, said paint comprising:

a drag reducing polymer;

a carrier resin for suspending said drag reducing polymer;

a drier; and

a diluent.

5,488,077

SULFUR CURED RUBBER COMPOSITION CONTAINING EPOXIDIZED NATURAL RUBBER AND CARBOXYLATED NITRILE RUBBER

Paul H. Sandstrom, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 313,954, Sep. 28, 1994. This application May 30, 1995, Ser. No. 452,929

Int. Cl.[6] C08L *9/00;13/00;15/00;* C08K *3/36*

U.S. Cl. 523—438 7 Claims

1. A sulfur cured rubber composition composed of, based on 100 parts by weight of rubber (phr);

(a) 1.0 to 15 parts by weight of epoxidized natural rubber, wherein the level of epoxidized modification is in the range of from about 15 to 85 mole percent;

(b) 1.0 to 15 parts by weight of a carboxylic acid group containing nitrile rubber; and

(c) 98 to 70 parts by weight of a rubber selected from the group consisting of medium vinyl polybutadiene, styrene-butadiene rubber, synthetic cis-1,4-polyisoprene, synthetic 3,4-polyisoprene, natural rubber, cis-polybutadiene, styrene-isoprene rubber, styrene-isoprene-butadiene rubber, acrylonitrile-butadiene rubber and mixtures thereof.

5,488,078

COMPOSITIONS FOR CONSTRUCTION MATERIALS

John R. Shutt, Tervuren, Belgium, and Benoit M. F. Touzard, Mont-Saint-Aignan, France, assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Apr. 28, 1994, Ser. No. 234,522

Claims priority, application United Kingdom, Apr. 29, 1993, 9308883

Int. Cl.[6] C08L *95/00;57/02;* C08K *5/01*

U.S. Cl. 524—71 23 Claims

1. A composition comprising a two-phase mixture of

(a) a structural bitumen component; and

(b) from 1 to 20 wt % of a thermoplastic polymer derived predominantly of ethylene and at least one other non-cyclic alpha olefin having at least four carbon atoms, said polymer having a crystallinity of less than 18%, and a Solubility Distribution Breadth Index value of less than 28° C., in which the wt % is based on the total weight of the polymer and the bitumen component.

5,488,079

POLYOLEFIN STABILIZATION

Peter Staniek, Kandern, Germany, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 217,164, Mar. 23, 1994, abandoned. This application Oct. 17, 1994, Ser. No. 324,430

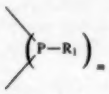
Claims priority, application United Kingdom, Mar. 25, 1993, 9306186; Feb. 11, 1994, 9402696

Int. Cl.[6] C08K *5/50*

U.S. Cl. 524—116 **2 Claims**

1. A polyolefinic composition comprising:

Component a) a compound according to formula III



(III

in which

R_1 independently is $C_{1\text{-}12}$alkyl, cyclohexyl, menthyl, or $C_{6\text{-}12}$aryl; and

m is 4 or 5and;

Component b) a polyolefin which has been produced in the presence of a Ziegler or metallocene type catalyst which has not been removed;

wherein Component a) is present in an amount of 0.005–5% based on the weight of polymer present in the composition.

5,488,080

RUBBER AND PLASTIC BONDING

John D. Osborn, Wortham, Tex., assignor to Encore Technologies, Inc., Houston, Tex.

Continuation of Ser. No. 886,338, May 20, 1992, abandoned. This application Apr. 13, 1994, Ser. No. 227,017

Int. Cl.[6] C08L *23/00;* **C08J** *11/04*

U.S. Cl. 524—270 **21 Claims**

1. A dry liquid concentrate mixture for use with organic compounds in nonvulcanized curing systems for plastics, recycled plastics, thermoplastics, thermoplastic elastomers, polyacrylics, polyurethanes, asphalt, and emulsions thereof, including latex, comprising a uniform mixture of:

a. substantially dry crumb rubber including cured and shaped rubber particles;

b. a liquid agent taken from the group consisting of fatty acids and tall oil pitches within the following ranges of characteristics:

Viscosity, (centistokes at 99° C.)	10 to 1,000
Acid Number (Total)	15 to 330
Saponification Number	10 to 350
Fatty Acids, %	5% to 100%
Rosin Acids, %	0% to 70%
Unsaponifiables	5% to 80%;

wherein the moisture content of said rubber particles and liquid agent is not more than 0.5%.

5,488,081

HIGHLY DAMPED ORGANIC ELASTOMER COMPOSITION

James R. Halladay, Erie, Pa., assignor to Lord Corporation, Cary, N.C.

Filed Nov. 4, 1993, Ser. No. 148,119

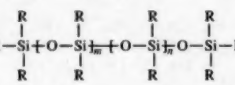
Int. Cl.[6] C08K *5/11*

U.S. Cl. 524—314 **17 Claims**

1. An elastomeric composition consisting essentially of a mixture comprising

(a) a heat-vulcanizable organic elastomer which is selected from the group consisting of natural rubber, polyisoprene, polybutadiene, polychloroprene, acrylonitrile/butadiene copolymer rubber, and mixtures thereof, the heat-vulcanizable organic elastomer being present in an amount ranging from about 20 to 80 percent by weight of total elastomer Composition,

(b) a polyorganosiloxane wherein the polyorganosiloxane is represented by the following formula:



wherein R may be the same or different and is a straight-chain, branched, cyclic, or aromatic hydrocarbon radical, and having from about 1 to 20 carbon atoms and wherein m or n can be zero and the sum of (m+n) is an integer in the range from about 2 to 2000

(c) a polyorganosilsesquioxane, and

(d) a compatibilizer; the compatibilizer being present in an amount ranging from about 1 to 30 percent by weight of the total elastomer composition, and

the combination of the polyorganosiloxane and the polyorganosilsesquioxane being present in an amount ranging from about 3 to 30 percent by weight of the total elastomer composition, wherein the ratio of polyorganosiloxane to polyorganosilsesquioxane in the combination ranges from about 3:1 to 1:3.

5,488,082

POLYMERIC ADHESIVE PASTE

Raymond L. Dietz, Georgetown, and David M. Peck, Beverly, both of Mass., assignors to Diemat, Inc., Topsfield, Mass.

Continuation-in-part of Ser. No. 100,052, Jul. 30, 1993, Pat. No. 5,391,604. This application Feb. 17, 1995, Ser. No. 390,257

Int. Cl.[6] C08K *3/10;3/08*

U.S. Cl. 524—403 **18 Claims**

1. An adhesive paste consisting essentially of:

(A) about 10–50 volume percent at least one organic polymer resin;

(B) up to about 40 volume percent inorganic filler; and

(C) about 30–65 volume percent fugitive liquid;

wherein each of the resin and the filler is present in particulate form of size sufficiently small to pass through a Number 325 mesh screen, and wherein the liquid and organic polymer resin are each substantially insoluble in the other.

5,488,083

METHOD OF GELLING A GUAR OR DERIVATIZED GUAR POLYMER SOLUTION UTILIZED TO PERFORM A HYDRAULIC FRACTURING OPERATION

E. Wayne Kinsey, III, Odessa; Sharif Sharif, and David N. Harry, both of Midland, all of Tex., assignors to Benchmark Research and Technology, Inc., Midland, Tex.

Filed Mar. 16, 1994, Ser. No. 213,868

Int. Cl.[6] C09K *3/00;* **E21B** *43/26*

U.S. Cl. 507—211 **10 Claims**

1. A method of gelling a guar or derivatized guar polymer solution utilized to perform a hydraulic fracturing operation, comprising the steps of:

adjusting the pH of the guar or derivatized guar polymer solution to between about 8.5 and 12.5;

adding to the guar or derivatized guar polymer solution an anhydrous boron compound or a sparingly soluble borate suspended in a solution selected from the group consisting of a mineral spirits-resin solution and an oil-resin solution;

pumping the guar or derivatized guar polymer solution and the anhydrous boron compound or the sparingly soluble borate

suspended in a solution selected from the group consisting of a mineral spirits-resin solution and an oil-resin solution into a subterranean formation under sufficient pressure to cause a fracture in the formation rock.

5,488,084

POLYPHENYLENE SULFIDE RESIN COMPOSITION

Sho Kadoi, Ichihara; Hidemi Yabe, and Kazuhiko Kobayashi, both of Nagoya, all of, Japan, assignors to Toray Industries, Inc., Japan

Continuation of Ser. No. 924,424, Jul. 31, 1992, abandoned, which is a continuation of Ser. No. 512,865, Apr. 23, 1990, abandoned. This application Dec. 14, 1993, Ser. No. 166,735

Claims priority, application Japan, Apr. 25, 1989, 1-106197

Int. Cl.[6] C08F *283/06;283/04;* **C08L** *81/04*

U.S. Cl. 524—423 **7 Claims**

1. A polyphenylene sulfide resin composition consisting essentially of (a) 99 to 1 parts by weight of a modified polyphenylene sulfide resin obtained by reacting a polyphenylene sulfide resin with 0.03 to 30% by weight, based on the polyphenylene sulfide resin, of at least one carboxylic acid anhydride selected from the group consisting of maleic, itaconic and succinic anhydrides, and (b) 1 to 99 parts by weight of a polyamide resin, both resins (a) and (b) being melt-kneaded together.

5,488,085

SEMI-BATCH PROCESS FOR PRODUCING POLYMER POLYOLS

John E. Hayes, Wilmington, Del.; Donald W. Simroth, Charleston, W. Va., and Xinhua Zhou, West Chester, Pa., assignors to ARCO Chemical Technology, L.P., Greenville, Del.

Filed Aug. 18, 1994, Ser. No. 292,531

Int. Cl.[6] C08L *25/12;75/00*

U.S. Cl. 525—53 **30 Claims**

1. A semi-batch process for preparing a final polymer polyol comprising the in-situ polymerization in a batch reactor of one or more ethylenically unsaturated monomers in a polyether polyol media in the presence of a seed polymer polyol, wherein from about 0.25 to about 3 weight percent of the polymer solids in the final polymer polyol comes from the seed polymer polyol, and wherein the final polymer polyol has a broader particle size distribution as compared to an identically prepared polymer polyol prepared in the absence of the seed polymer polyol.

5,488,086

POLYCARBONATE RESIN COMPOSITION

Takashi Umeda, and Masaya Okamoto, both of Ichihara, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP91/01755, § 371 Date Jul. 28, 1992, § 102(e) Date Jul. 28, 1992, PCT Pub. No. WO92/12208, PCT Pub. Date Jul. 23, 1992

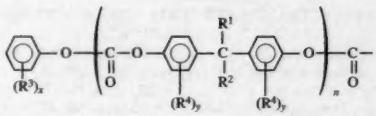
Continuation of Ser. No. 916,002, Jul. 28, 1992, abandoned. This PCT application Dec. 25, 1991, Ser. No. 209,591

Claims priority, application Japan, Dec. 27, 1990, 2-415108; Dec. 27, 1990, 2-415109; Dec. 27, 1990, 2-415110; Dec. 27, 1990, 2-415111

Int. Cl.[6] C08L *69/00;83/10*

U.S. Cl. 525—92 A **20 Claims**

1. A polycarbonate resin composition which comprises (A) a mixture of polycarbonate and a polycarbonate/polydimethylsiloxane copolymer comprising a polycarbonate block of the formula (a):



(a)

wherein R^1 and R^2 independently are hydrogen, an alkyl group having 1 to 4 carbon atoms,

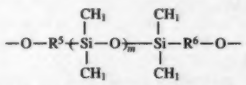
R^3 and R^4 independently are a halogen, an alkyl group having 1 to 20 carbon atoms or an aryl group,

x is an integer of at most 5,

y is an integer of at most 4, and

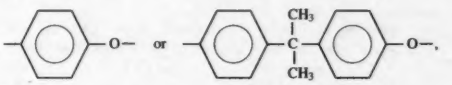
n is an integer of 1 to 100, and

a polydimethylsiloxane block of the formula (b):



(b)

wherein R^5 and R^6 independently are a 3-(o-hydroxyphenyl)propyl group, a 2-(p-hydroxyphenyl)ethyl group or a group represented by the formula



and m is an integer of more than 100,

said copolymer mixture having 0.5 to 10% by weight of the polydimethylsiloxane block, 1.0% by weight or less of an n-hexane soluble matter content, and a viscosity average molecular weight of 10,000 to 50,000, and

(B) at least one selected from the group consisting of a thermoplastic resin and a rubber elastomer.

5,488,087

PREPARATION OF POLYDIORGANOSILOXANE AND SULFONATED POLYOLEFIN BLENDS

Israel Cabasso, Syracuse, N.Y., and Daniel Graiver, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich., and University of New York, Albany, N.Y.

Filed Jun. 16, 1994, Ser. No. 261,080

Int. Cl.[6] C08L *83/04*

U.S. Cl. 525—100 **16 Claims**

1. A method for preparing a blend comprising a polydiorganosiloxane and a sulfonated polyolefin, the method comprising:

(A) swelling a solid, sulfonated polyolefin with a liquid comprising a diorganosiloxane oligomer and

(B) maintaining the solid, sulfonated polyolefin at a temperature sufficient for sulfonic acid substituents of the solid, sulfonated polyolefin to catalyze the polymerization of the diorganosiloxane oligomers within the solid, sulfonated polyolefin;

where the diorganosiloxane oligomer contains from three to about 40 units of the formula R_2SiO, each R is independently selected from a group consisting of alkyl radicals comprising one to about 12 carbon atoms, alkenyl radicals comprising two to about 12 carbon atoms, aryls, and fluorine substituted alkyl radicals comprising one to about 12 carbon atoms.

5,488,088

PROCESS FOR THE PREPARATION OF COPOLYMERS OF POLYSUCCINIMIDE

Louis L. Wood, Rockville, and Gary J. Calton, Elkridge, both of Md., assignors to Bayer AG, Leverkusen, Germany

Division of Ser. No. 994,922, Dec. 22, 1994, Pat. No. 5,408,028. This application Apr. 13, 1995, Ser. No. 421,614

Int. Cl.[6] C08G *69/10;73/10*

U.S. Cl. 525—432 **3 Claims**

1. A process for the preparation of copolymers of polysuccinimide comprising reacting maleic acid, a polycarboxylic acid and ammonia at a temperature of 120°–350° C.

5,488,089

CURABLE RESIN COMPOSITION

Koji Yamada, and Motoshi Yabuta, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Filed Oct. 17, 1994, Ser. No. 323,767

Claims priority, application Japan, Jan. 15, 1993, 5-280689; Dec. 17, 1993, 5-343264

Int. Cl.[6] C08F *283/02*

U.S. Cl. 525—463 **12 Claims**

1. A curable resin composition which comprises as main components

(A) a polymer having, in one molecule, epoxy group(s), and functional group(s) in each of which a carbonate ester group (—O—CO—O—) is directly bound to an aromatic ring, and

(B) a curing reaction catalyst.

5,488,090

Patent Not Issued For This Number

5,488,091

HIGH MOLECULAR WEIGHT POLYSTANNANES BY METAL-CATALYZED DEHYDROPOLYMERIZATION

T. Don Tilley, Rancho Penasquitos, Calif., and Toru Imori, Saitama, Japan, assignors to The Regents of the University of California, Oakland, Calif.

Filed Jun. 24, 1994, Ser. No. 265,447

Int. Cl.[6] C08G *79/00*

U.S. Cl. 528—9 **33 Claims**

1. A method for making a tin compound having at least one tin-tin bond comprising:

combining first and second reactants each containing a tin-hydrogen bond; and

dehydrogenating said reactants in the presence of a tin coupling agent to form hydrogen gas and combine said reactants to form said tin compound having said tin-tin bond.

5,488,092

LOW VOC, PRIMERLESS, POLYURETHANE COMPOSTIONS

Charles M. Kausch, Akron; Earl G. Melby, Uniontown, and Satish C. Sharma, Stow, all of Ohio, assignors to GenCorp Inc., Fairlawn, Ohio

Filed Apr. 26, 1994, Ser. No. 233,870

Int. Cl.[6] C08G *18/10;18/30*

U.S. Cl. 528—60 **16 Claims**

1. A heat curable primerless one-part polyurethane composition, comprising:

a blocked polyurethane prepolymer, the precursor polyurethane of said blocked polyurethane prepolymer comprising the reaction product of from about 2 to about 8 isocyanate equivalents of a polyisocyanate for each hydroxyl equivalent of a liquid hydroxyl terminated polyol intermediate, said liquid hydroxyl terminated polyol intermediate comprising poly(1,2-butylene oxide), and

wherein said liquid hydroxyl terminated polyol intermediate has a number average molecular weight from about 400 to about 10,000.

a sufficient amount of a curing agent to cure said blocked polyurethane prepolymer upon heating, and

a sufficient amount of a low friction polymer, or a silicone oil, or mixtures thereof, to impart abrasion resistance to the polyurethane composition when cured,

wherein said polyurethane composition is free of the reaction product of one or more polyisocyanates with hydroxyl terminated hydrocarbon polymers of number average molecular weight of from about 500 to about 15,000 having at least 1.5 hydroxyl groups per molecule, said hydroxyl terminated hydrocarbon polymers consisting of hydrogenated diene polymers and polyolefins.

5,488,093

STIFF-CHAIN POLYESTERS AND A METHOD OF PREPARING THEM

Gerhard Kossmehl, and Bettina Lundt, both of Berlin, Germany, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Mar. 27, 1995, Ser. No. 411,307

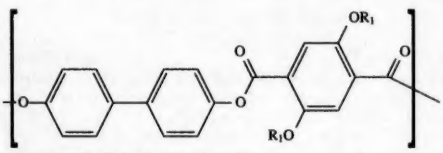
Claims priority, application Germany, Mar. 31, 1994, 44 11 361.7

Int. Cl.[6] C08G *63/18*

U.S. Cl. 528—193 **18 Claims**

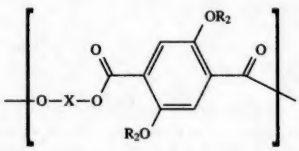
1. A polyester characterized by comprising the following arranged in any desired sequence: repeated units A having the formula:

A (I)



repeated units B having the formula:

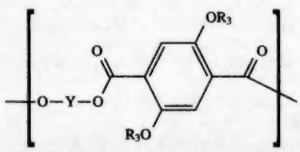
B (II)



and

repeated units C having the formula:

C (III)



in which R_1, R_2 and R_3 independently stand for n-pentyl or 3-methyl butyl, X and Y are the same or different and each stand for a divalent aromatic or alicyclic hydrocarbon group different

from 4,4'-biphenyl, and the molar ratio of A: (B+C) is 1:99 to 99:1, the average sum of the repeating units A+B+C in the polymer molecule being in the range from 20 to 200 and one of two terminal repeated units on the oxy group bearing a hydrogen atom and the other of the two terminal repeated units on the carbonyl group bearing a hydroxyl group.

5,488,094

PROCESS FOR THE PREPARATION OF POLYCARBONATE

Tatsuya Kanno, and Yutaka Fududa, both of Hyogo, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 209,820, Mar. 11, 1994, Pat. No. 5,466,775, which is a division of Ser. No. 132,132, Oct. 5, 1993, abandoned. This application Dec. 9, 1994, Ser. No. 353,432

Claims priority, application Japan, Jan. 14, 1992, 4-275720; Dec. 24, 1992, 4-344054; Apr. 16, 1993, 5-89916; Apr. 16, 1993, 5-89918; Jul. 7, 1993, 5-167658; Jul. 7, 1993, 5-167659; Jul. 7, 1993, 5-167660

Int. Cl.[6] C08G *64/00*

U.S. Cl. 528—199 **15 Claims**

1. A process for preparing a polycarbonate consisting essentially of a step of melt-polycondensing a dihydric phenol with a carbonic diester not containing methyl phenyl carbonate in an amount greater than 50 ppm or tin ion in an amount exceeding 5 ppm, at a ratio of 1.01 to 1.5 mol of carbonic diester per mol of dihydric phenol and a temperature of from 100° to 300° C.

5,488,095

CONDENSATION PRODUCTS THAT CONTAIN N,O-ACETAL OR CARBOXAMIDE STRUCTURES, PREPARATION THEREOF, USE THEREOF, AND CONDENSATION PRODUCTS THAT CONTAIN ACETAL-LACTONE STRUCTURES

Dieter Boeckh, Limburgerhof; Angelika Funhof, Heidelberg; Matthias Kroner, Eisenberg; Heinrich Hartmann, Limburgerhof; Richard Baur, Mutterstadt; Alexander Kud, Eppelsheim, and Volker Schwendemann, Neustadt, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jan. 18, 1995, Ser. No. 367,230

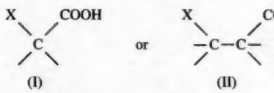
Claims priority, application Germany, Jul. 20, 1992, 42 23 807.2

Int. Cl.[6] C08G *63/06;12/00*

U.S. Cl. 528—361 **7 Claims**

1. A condensation product that contains an N,O-acetal or carboxamide structure, obtained by condensation of

(a) a compound that contains at least one unit of the structural element



(I) or (II)

wherein X is OH or NHR, where R is C_{1-6} alkyl or $-(CH_2)_n-$ COOH wherein n is an integer of 1–4; with

(b) an aldehyde, ketone, aldehyde-carboxylic acid or keto-carboxylic acid to form an acetal-lactone; and subsequent cleavage of said acetal-lactone with

(c) an amine selected from the group consisting of an aminocarboxylic acid, a primary amine, a secondary amine, a polyethyleneimine and a mixture thereof.

5,488,096

COPOLYMERS OF CARBON MONOXIDE AND AN OLEFINICALLY UNSATURATED COMPOUND AND PROCESS FOR THE PREPARATION THEREOF

Eit Drent, and Dennis H. L. Pello, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 9, 1994, Ser. No. 258,406

Claims priority, application European Pat. Off., Jun. 29, 1993, 93201894

Int. Cl.[6] C08G *37/02*

U.S. Cl. 528—392 **15 Claims**

1. A polymer of carbon monoxide and one or more olefinically unsaturated compounds wherein the polymer chain is linear, and contains units originating from the olefinically unsaturated compounds and monomer units originating from the carbon monoxide in a molar ratio of from 52.5:47 to 80:20, having therein monomer units arranged in a random order, and wherein from about 50 to 95% of the bonds between monomer units comprise olefinically unsaturated monomers bonded to each other.

5,488,097

Patent Not Issued For This Number

5,488,098

MONOAZO COMPOUNDS HAVING VINYLSULFONE TYPE FIBER REACTIVE GROUP AND METHOD FOR DYEING OR PRINTING FIBER MATERIALS USING THE SAME

Masayuki Miki, Ashiya; Kingo Akahori, Toyonaka; Yutaka Kayane, Ikoma, and Takeshi Washimi, Toyonaka, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

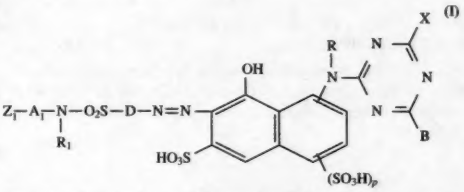
Continuation of Ser. No. 840,560, Feb. 25, 1992, abandoned. This application Feb. 7, 1994, Ser. No. 193,646

Claims priority, application Japan, Feb. 27, 1991, 3-033047; Feb. 28, 1991, 3-034245

Int. Cl.[6] C09B *62/51;62/085;* **D06P** *1/384*

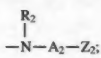
U.S. Cl. 534—605 **11 Claims**

1. A monoazo compound represented by the following formula (I) in the free acid form,

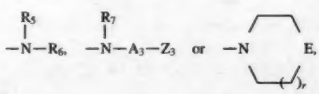


(I)

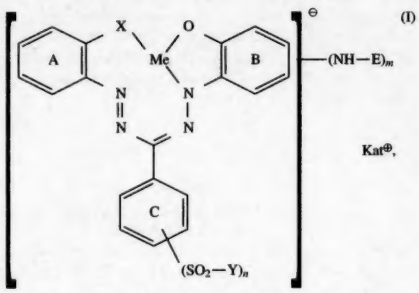
wherein D is phenylene unsubstituted or substituted once or twice by a substituent selected from the group consisting of methyl, ethyl, methoxy, ethoxy, chloro, bromo and sulfo and naphthylene unsubstituted or substituted by sulfo; X is an unsubstituted or substituted pyridinio group or



B is $-SR_4$,



in which R_4, R_5 and R_6 independently of one another are each hydrogen; alkyl having 1 to 4 carbon atoms unsubstituted or substituted once or twice by a substituent selected from the group consisting of alkoxy having 1 to 4 carbon atoms, sulfo, carboxy, hydroxy, chloro, phenyl, cyano and sulfato; phenyl unsubstituted or substituted once or twice by a substituent selected from the group consisting of alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, sulfo, carboxy, chloro and bromo; naphthyl unsubstituted or substituted once, twice or three times by a substituent selected from the group consisting of hydroxy, carboxy, sulfo, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms and chloro; benzyl unsubstituted or substituted once or twice by a substituent selected from the group consisting of alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, sulfo and chloro, r is 0 or 1, and E is O, SO, SO_2, CH_2 or NR_8, in which R_8 is hydrogen or C_1–C4 alkyl; R, R_1, R_2 and R_7 independently of one another are each hydrogen, an unsubstituted alkyl group or an alkyl group substituted by at least one substituent selected from the group consisting of hydroxy, cyano, alkoxy, halo, carbamoyl, carboxy, alkoxycarbonyl, alkylcarbonyloxy, sulfo and sulfamoyl; A_1, A_2 and A_3 independently of one another are each phenylene unsubstituted or substituted once or twice by a substituent selected from the group consisting of methyl, ethyl, methoxy, ethoxy, chloro, bromo and sulfo and naphthylene unsubstituted or substituted by sulfo; Z_1, Z_2 and Z_3 independently of one another are each $—SO_2CH=CH_2$ or $—SO_2CH_2CH_2Y$, in which Y is a group capable of being split by the action of an alkali; and p is 0 or 1.



where

m and n are each independently of one another 1 or 2,

$Kat^{\oplus}$ is the equivalent of a cation,

Me is copper or nickel,

X is oxygen or a radical of the formula CO—O or SO_2—O,

Y is vinyl or a radical of the formula C_2H_4—Q, wherein Q is a group that is detachable under alkaline reaction conditions,

E is a heterocyclic fiber-reactive radical selected from the group consisting of 1,3,5-triazine, quinoxaline, phthalazine, pyridiazone and 2-alkylsulfonylbenzothiazole or a fiber-reactive radical of the formula L-W, wherein L is a bridge member and W is a fiber-reactive radical of the aliphatic series,

the rings A and B are each substituted or unsubstituted and may be benzofused, and

the ring C is substituted or unsubstituted.

5,488,099

MULTIFUNCTIONAL CHIMERIC NEUROTROPHIC FACTORS

Hakan B. Persson, deceased, Vreta Gard, late of S-14743 Tumba, and Carlos F. I. Moliner, Tangvagen 29, S-12638 Hagersten, both of, Sweden

Continuation-in-part of Ser. No. 847,369, Mar. 6, 1992, Pat. No. 5,349,055. This application Nov. 20, 1992, Ser. No. 979,630

Int. Cl.[6] C07K *14/475;14/48*

U.S. Cl. 530—399 **4 Claims**

1. A chimeric neurotrophin comprising a neurotrophin selected from the group consisting of BDNF and NT-3 wherein amino acids 3–9 of said selected neurotrophin are replaced with amino acids 3–9 of NGF.

5,488,100

FORMAZAN-BASED REACTIVE DYES WITH AT LEAST TWO REACTIVE GROUPS, AND AMINOPHENOLS

Claus Marschner, Speyer, and Manfred Patsch, Wachenheim, both of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 136,131, Oct. 15, 1993. This application Mar. 22, 1995, Ser. No. 407,955

Claims priority, application Germany, Jan. 16, 1992, 42 34 900.1

Int. Cl.[6] C09B *62/503;62/463;* **D06P** *1/384*

U.S. Cl. 534—618 **7 Claims**

1. A formazan dye of the formula I

5,488,101

TRISAZO COMPOUNDS, METHOD FOR DYEING FIBER MATERIALS, PAPER OR LEATHER USING THE SAME AND INKS CONTAINING THE SAME

Kazuya Ogino, Minoo; Kingo Akahori, Toyonaka; Naoki Harada, Ibaraki; Yutaka Kayane, Ikoma; Hideo Kawashita, Minoo, and Mituhiro Ohta, Osaka, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

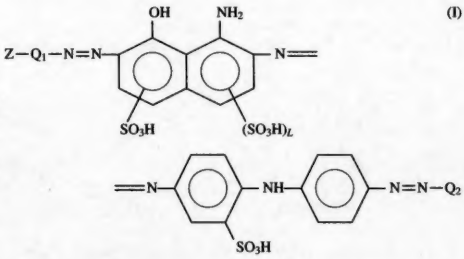
Filed Jun. 5, 1992, Ser. No. 894,561

Claims priority, application Japan, Jun. 10, 1991, 3-138010

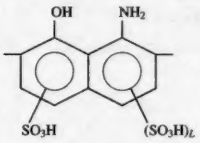
Int. Cl.[6] C09B *35/46;62/513;* **C09D** *11/02;* **D06P** *1/384*

U.S. Cl. 534—680 **17 Claims**

1. A trisazo compound represented by the following formula (I) in the free acid form:



wherein Q_1 is an unsubstituted or substituted phenylene or naphthylene group, Q_2 is an unsubstituted or substituted phenyl or naphthyl group, Z is $—SO_2CH_2CH_2OH$ or $—SO_2CH_2CH_2SO_3H$ group, and L is 0 or 1, provided that when



Z is $—SO_2CH_2CH_2OH$ group, Q_2 is the naphthyl group as defined above.

5,488,102

POLYMERISABLE CARBOHYDRATE ESTERS, POLYMERS THEREFROM AND THEIR USE

Dirk Vetter, Freiburg, Germany, assignor to Ciba Geigy Corporation, Tarrytown, N.Y.

PCT No. PCT/EP93/03236, § 371 Date Jul. 26, 1994, § 102(e) Date Jul. 26, 1994, PCT Pub. No. WO94/12540, PCT Pub. Date Jun. 9, 1994

PCT Filed Nov. 19, 1993, Ser. No. 256,828

Claims priority, application Switzerland, Nov. 30, 1992, 3655/92

Int. Cl.[6] C08B *3/00;5/00;7/00;13/00*

U.S. Cl. 536—32 **39 Claims**

1. A compound of formula I or Ia

$$R—Y—CO—R_3—CO—O—A \quad (I),$$

$$R—Y—CO—R_3—CO—O—CH_2—A_1 \quad (Ia),$$

wherein

R is a radically polymerizable hydrocarbon group,

R_3 is a direct bond, linear or branched C_1–C_{22}alkylene, C_3–C_8cycloalkylene or C_6–C_{14}arylene,

A is a radical, reduced by a hydroxy group in a 2- or 3- position, of a cyclic-oligomeric carbohydrate or of a derivative of such a carbohydrate,

A_1 is a radical, reduced by a hydroxymethyl group of a monomeric or linear or branched oligomeric carbohydrate or of a derivative of such a carbohydrate, and

Y is —O—, —NH—, or —N(C_1–C_6alkyl)—.

5,488,103

HYDROGEN SULFIDE CONVERTER

Larry W. Gatlin, Rte. 2, Box 181A, Hwy. 1301, Floresville, Tex. 78114

Continuation of Ser. No. 51,185, Apr. 22, 1993, abandoned, which is a continuation of Ser. No. 728,522, Jul. 11, 1991, abandoned. This application May 15, 1995, Ser. No. 441,354

Int. Cl.[6] C07H *5/04;1/00;* **C07C** *45/00*

U.S. Cl. 536—55.2 **15 Claims**

1. A composition useful for converting hydrogen sulfide and organic sulfides in aqueous or hydrocarbon-containing liquid or gaseous streams to water soluble, nontoxic polymers, the composition comprising the reaction product off

an effective amount of a first component comprising sterically hindered alkyl diamines selected from the group consisting of aminomethylcyclopentylamine; 1,2-cyclohexanediamine; 1,5 -pentanediamine, 2-methyl; 1,6-hexanediamine; 1H-azepine, hexahydro; 1,4-butanediamine; and mixtures thereof; and

an effective amount of a second component selected from the group consisting of monoaldehydes and dialdehydes having from 1 to 6 carbon atoms, and mixtures thereof.

5,488,104

PROCESS FOR COMMINUTING CELLULOSE ETHERS

Gary J. Schulz, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 30, 1994, Ser. No. 268,402

Int. Cl.[6] C08B *11/00;11/02;11/20;11/193*

U.S. Cl. 536—86 **20 Claims**

1. A process for comminuting a water-soluble cellulose ether which comprises:

(a) extruding an aqueous hydrated cellulose ether of water-soluble cellulose ether through a plurality of orifices of cross-sectional area of about 7.5×10^{-9} m^2 to about 1×10^{-6} m^2 to form an elongated cellulose ether extrudate wherein a multiplicity of fibers are lined up parallel to each other and then;

(b) cutting the elongated cellulose ether extrudate.

5,488,105

POLYSACCHARIDES OF HYMENAEA SEEDS

Yoichiro Uno, Kobe; Fumio Takeno, Osaka; Kazuhiko Yamatoya, Izumisano, and Keiji Ohtsu, Nishinomiya, all of, Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

PCT No. PCT/JP92/00502, § 371 Date Oct. 14, 1993, § 102(e) Date Oct. 14, 1993

PCT Filed Apr. 18, 1992, Ser. No. 137,008

Claims priority, application Japan, Apr. 19, 1991, 3-116834

Int. Cl.[6] C07H *1/08;* **A61K** *35/78;* **A23L** *3/00;* **A23B** *7/00*

U.S. Cl. 536—128 **2 Claims**

1. A food additive consisting essentially of a polysaccharide having:

(a) a molecular weight of 5,000 to 2,000,000;

(b) arabinose, xylose, glucose and galactose as constituent sugars;

(c) a main chain β-(1→4)-glucan;

(d) a viscosity of 110–120 cps when in a 0.65% aqueous solution and when said aqueous solution is heated to 75° C. for 15 minutes; and

(e) is extracted from the seeds of a Hymenaea plant from an extraction process comprised of the following steps:

(i) steeping the seeds in water and removing the testae;

(ii) crushing and drying the seeds to form a crude polysaccharide powder;

(iii) suspending the crude polysaccharide in an alkaline-alcohol solution to remove impurities and form a purified polysaccharide; and

(iv) drying and crushing the purified polysaccharide to form a purified polysaccharide powder.

5,488,106

PROCESS FOR PREPARING 6-[(ISOXAZOLINYL)METHYL]PENICILLANIC ACID 1,1-DIOXIDE COMPOUNDS

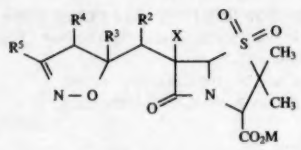
Carl Ziegler; Paul Fabio, both of Pearl River, N.Y.; Karen Bush, Kingston, N.J., and Deborah Steinberg, Pomona, N.Y., assignors to American Cyanamid Company, Wayne, N.J.

Filed Feb. 7, 1994, Ser. No. 193,496

Int. Cl.[6] C07D *499/00;* **A61K** *31/43*

U.S. Cl. 540—310 **2 Claims**

1. A method of producing a compound of the formula:



wherein:

M is H, Na, Li or K;

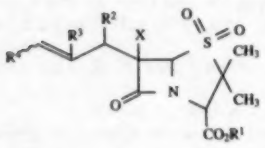
X is OH or Br;

R^2 is H; C_1–C_4 alkyl; C_1–C_4 substituted alkyl with substitution selected from F, Cl, Br, I, OH and NH_2; acetate; benzoate; F; Cl; Br or I;

R^3 is H; C_1–C_4 alkyl; C_1–C_4 substituted alkyl with substitution selected from F, Cl, Br, I, OH and NH_2; OH; NH_2; acetyloxy; benzoate; F, Cl; Br or I;

R^4 is H; C_1–C_4 alkyl; C_1–C_4 substituted alkyl with substitution selected from F, Cl, Br, I, OH and NH_2; acetate; benzoate; F; Cl; Br or I;

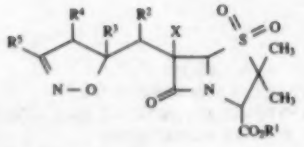
R^5 is H; C_1–C_4 alkyl; C_1–C_4 substituted alkyl with substitution selected from F, Cl, Br, I, OH and NH_2; 2- or 3-thienyl; F; Cl; Br; I; phenyl; substituted phenyl with substitution selected from C_1–C_4 alkyl, F, Cl, Br, I, OH and NH_2; which comprises reacting a compound of the formula:



wherein R^2, R^3, R^4 and X are as defined hereinabove and R^1 is a carboxylic acid protecting group; with a compound of the formula:

R^5—C≡N⁺O⁻,

wherein R^5 is as defined hereinabove; at a temperature of about −78° C. to about 25° C. for a time of about 0.5 to 5 hours, to obtain a compound of the formula:



wherein R^1, R^2, R^3, R^4, R^5, and X are as defined hereinabove; and deprotecting the carboxylic acid group to obtain the desired compound.

5,488,107

Patent Not Issued For This Number

5,488,108

TRIAZINE COMPOUNDS AS UV ABSORBERS FOR PHOTOGRAPHIC MATERIAL

David G. Leppard, Marly; Kurt Burdeska, Basel, and Mario Slongo, Taffers, all of, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

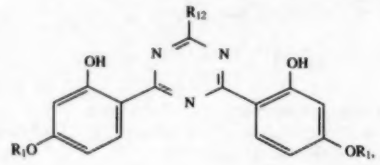
Division of Ser. No. 891,532, Jun. 1, 1992, Pat. No. 5,364,749. This application Aug. 11, 1994, Ser. No. 289,166

Claims priority, application Switzerland, Jun. 3, 1991, 1643/91; Sep. 4, 1991, 2601/91

Int. Cl.[6] C07D 251/24

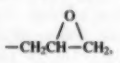
U.S. Cl. 544—216 **3 Claims**

1. A compound of the formula

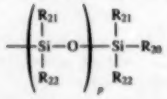


(Ic)

wherein the radicals R_1, independently of one another, are radicals of the formula —CH_2—$CH(OR_2)R_7$, —$CH_2CH(OR_2)CH_2OR_7$,



—CH_2COR_7 or —$CH_2COCH_2OR_7$, where R_2 is —COR_7, —$COOR_w$ or —$SiR_vR_xR_y$, R_7 is C_5–C_{18}alkyl or phenyl-C_1–C_4alkyl, R_z is C_1–C_{18}alkyl, C_2–C_{18}alkenyl, phenyl-C_1–C_4alkyl, —COR_z or oxygen-interrupted C_1–C_{24}alkyl or C_2–C_{24}hydroxyalkyl, R_z is C_1–C_{18}alkyl, C_2–C_{18}alkenyl or phenyl, R_w is C_1–C_8alkyl and R_v, R_x and R_y, independently of one another, are C_1–C_6alkyl or phenyl; or the radicals R_1, independently of one another, are G-II groups, where II is a group of the formula

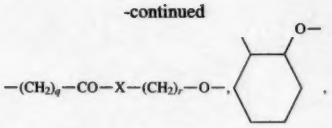


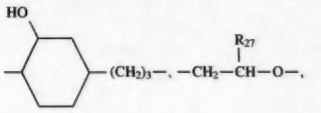
(II)

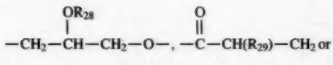
and G is a direct bond or a divalent group of one of the following formulae:

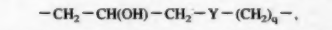
$-(CH_2)_q-$, $-(CH_2)_q-O-$, $-(CH_2)_q-O-R_{26}-$, $-(CH_2)_q-CO-X-(CH_2)_r-$,

-continued

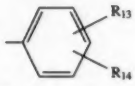








in which q and r, independently of one another, are 1–4 and p is 0–50, R_{26} C_1–C_{12}alkylene, cyclohexylene or phenylene, R_{27} is C_1–C_{12}alkyl, C_5–C_8cycloalkyl, phenyl, C_2–C_{13}alkoxymethyl, C_6–C_9cycloalkoxymethyl or phenoxymethyl, R_{28} is a group of the formula G-II, R_{29} is hydrogen or methyl, X is —O— or —NR_{23}—, in which R_{23} is hydrogen, C_1–C_{12}alkyl or a $(CH_2)_3$-G-II or —$(CH_2)_3$-O-G-II group, Y is —O— or —NH—, and R_{20}, R_{21} R_{22}, independently of one another, are C_1–C_{18}alkyl, cyclohexyl, phenyl or C_1–C_{18}alkoxy and R_{12} is alkyl having 1 to 12 carbon atoms or a group of the formula



or —OR_{16}, in which R_{13} and R_{14}, independently of one another, are hydrogen, C_1–C_4alkyl or chlorine, and R_{16} is alkyl having 1 to 8 carbon atoms or oxygen-interrupted alkyl having 3 to 12 carbon atoms,

with the proviso that R_1 is not —$CH_2CH(OR_x)R_y$ when R_y is —CH_3, R_x is —COR_z, R_z is C_1–C_6alkyl and R_{12} is chlorophenyl.

5,488,109

5-ALKOXY[1,2,4]TRIAZOLO[1,5-C]PYRIMIDINE-2(3H)—THIONE COMPOUNDS AND THEIR USE IN THE PREPARATION OF AND 2-CHLOROSULFONYL-5-ALKOXY[1,2,4]TRIAZOLO[1,5-C]-PYRIMIDINE COMPOUNDS

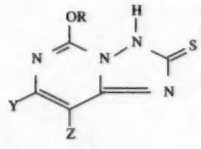
Thomas A. Olmstead, Midland; Michael A. Gonzalez, Sanford; Jon A. Orvik, Midland; Douglas L. Pearson, Midland; James W. Ringer, Midland; Dawn Shiang, Sanford; Jimmy J. Tai, and Anne P. Wallin, both of Midland, all of Mich., assignors to DowElanco, Indianapolis, Ind.

Filed Nov. 5, 1993, Ser. No. 148,790

Int. Cl.[6] C07D *487/04*

U.S. Cl. 544—263 **36 Claims**

1. A 5 -alkoxy[1,2,4]triazolo[1,5-c]pyrimidine-2(3H)-thione compound of the formula:



wherein

one of Y and Z represents F, Cl, Br, R', or OR' and the other represents H; and

R and R' each independently represents CH_3 or C_2H_5.

5,488,110

HIGHLY WATER SOLUBLE BIS-NAPHTHALIMIDES USEFUL AS ANTICANCER AGENTS

Jung-Hui Sun, Hockessin, Del., assignor to The Du Pont Merck Pharmaceutical Company, Wilmington, Del.

Continuation-in-part of Ser. No. 805,045, Dec. 11, 1991, abandoned. This application Mar. 29, 1994, Ser. No. 219,596

Int. Cl.[6] C07D *221/14;* **A61K** *31/47*

U.S. Cl. 546—100 **3 Claims**

1. A compound which is 2,2'-[1,2-ethanediylbis(methylimino-2,1-ethanediyl)-] -bis[5-nitro-1H-benz[de]isoquinoline-1,3(2H)-dione], and pharmaceutically acceptable salts thereof.

2. A compound which is 2-[2-[N-methyl-N-[2-[[2-(5-nitro-1H-benz[de]isoquinoline-2(3H)-yl)ethyl]amino]ethyl]amino]ethyl]-5-nitro-1H-benz[de]isoquinoline-1,3(2H)-dione, and pharmaceutically acceptable salts thereof.

3. 2,2'-[1,2-ethanediylbis(imino-2,1-ethanediyl)]-bis[5-nitro-1H-benz[de]isoquinoline-1,3(2H)-dione], and pharmaceutically acceptable salts thereof.

5,488,111

8-SULFO-3-QUINOLINE CARBOXYLIC ACID COMPOUNDS

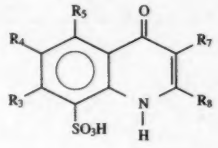
John C. Saukaitis, East Greenwich, R.I., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 288,374, Aug. 10, 1994, Pat. No. 5,466,808, which is a continuation-in-part of Ser. No. 180,593, Jan. 13, 1994, Pat. No. 5,430,152, which is a continuation-in-part of Ser. No. 17,583, Feb. 16, 1993, abandoned. This application May 22, 1995, Ser. No. 446,264

Int. Cl.[6] C07D *215/22*

U.S. Cl. 546—156 **4 Claims**

1. A compound of the formula:



wherein:

R_3 is hydrogen or chloro;

R_4 is hydrogen, chloro or fluoro;

R_5 is hydrogen, F, Cl, B, I, C_1—C_5 alkyl, a halogen substituted C_1 to C_5 alkyl, C_1 to C_5 alkoxy, NO_2—, R_nN— wherein R is independently hydrogen or C_1 to C_5 alkyl and n=2;

R_7 is carboxy; and

R_8 is hydrogen or C_1—C_5 alkyl.

5,488,112

DIMERIC BENZOTRIAZOLES AS UV ABSORBERS

Dieter Reinehr, Kandern, Germany; Jean-Pierre Bacher, Buschwiller, and André Schmitter, Hegenheim, both of, France, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

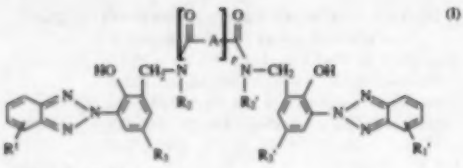
Filed Feb. 22, 1995, Ser. No. 392,638

Claims priority, application Switzerland, Feb. 24, 1994, 554/94

Int. Cl.[6] C07D *403/14;249/20*

U.S. Cl. 548—261 **5 Claims**

1. A compound of the formula I



(I)

in which p is 0 or 1;

A is C_1–C_{12}alkylene;

R_1 and R'_1, independently of one another, are hydrogen, halogen, C_1–C_{18}alkyl, C_1–C_{18}alkoxy or —CN;

R_2 and R'_2, independently of one another, are hydrogen or C_1–C_{18}alkyl or together are C_2–C_{12}alkylene or C_2–C_{12}hydroxyalkylene; and

R_3 and R'_3, independently of one another, are hydrogen, halogen, C_1–C_{18}alkyl or C_1–C_{18}alkoxy.

5,488,113

PROCESS FOR THE PREPARATION OF 1-HYDROXYINDOLE COMPOUNDS

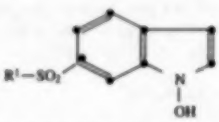
Raymond Fisher, Hyde, United Kingdom, assignor to Eastman Chemical Company, Kingsport, Tenn.

Division of Ser. No. 242,821, May 16, 1994, Pat. No. 5,434,271. This application Jan. 27, 1995, Ser. No. 379,042

Int. Cl.[6] C07D *209/10*

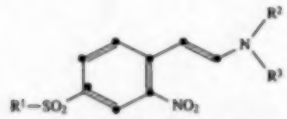
U.S. Cl. 548—508 **3 Claims**

1. Process for the preparation of a compound having the general formula



I

which comprises hydrogenating an enamine having the general formula



(II)

in the presence of tetrahydrofuran solvent and a catalytic amount of a palladium, platinum, rhodium or nickel hydrogenation catalyst under hydrogenation conditions of pressure and temperature, wherein R^1 is an organic radical and R^2 and R^3 each represent alkyl of up to 4 carbon atoms.

5,488,114

LABELLING COLOR, METHOD OF PREPARING THE SAME AND METHOD FOR DETECTING METHAMPHETAMINE WITH THE COLOR

Nobuyuki Shigetoh; Jipsei Miyazaki; Hiroshi Nakayama; Keiko Yugawa, and Tadayasu Mitsumata, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

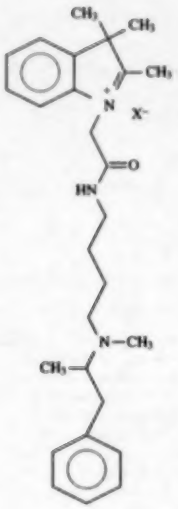
Division of Ser. No. 102,426, Aug. 5, 1993, Pat. No. 5,378,634. This application Sep. 16, 1994, Ser. No. 306,936

Claims priority, application Japan, Aug. 20, 1992, 4-221202; Nov. 16, 1992, 4-305219

Int. Cl.[6] C07D *209/04*

U.S. Cl. 548—510 **1 Claim**

1. A pentamethine intermediate which is a trimethyl indolenium salt of the following Formula:



wherein X is an anion.

5,488,115

ALCOHOLS

Kevin E. B. Parkes, Letchworth; Sally Redshaw, Stevenage, and Gareth J. Thomas, Welwyn, all of, Great Britain, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

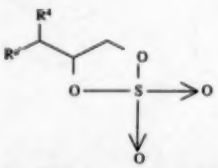
Division of Ser. No. 128,978, Sep. 29, 1993, which is a continuation of Ser. No. 615,204, Nov. 19, 1990, abandoned. This application May 12, 1995, Ser. No. 439,612

Claims priority, application United Kingdom, Dec. 11, 1989, 8927915

Int. Cl.[6] C07D *327/10*

U.S. Cl. 549—34 **2 Claims**

1. A compound of formula



V

wherein $R^{a'}$ is azido and R^4 is alkyl, cycloalkyl, cycloalkylalkyl, aryl or aralkyl.

5,488,116
TOTAL SYNTHESIS OF TAXOL AND ANALOGUES THEREOF

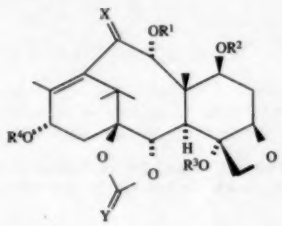
Samuel J. Danishefsky, New Haven, Conn.; William G. Bornmann, New York, N.Y.; Yves Queneau, Boulogne-Billancourt, France; Thomas V. Magee, Mystic, Conn.; Walter J. Krol, Newtown, Pa.; John J. Masters, and David K. Jung, both of New York, N.Y., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Continuation-in-part of Ser. No. 860,792, Mar. 30, 1992, Pat. No. 5,416,225. This application Nov. 2, 1993, Ser. No. 146,704

Int. Cl.[6] C07D *305/14;317/70*

U.S. Cl. 549—214 **2 Claims**

1. A compound having the structure:



wherein X is CH_2 or O; wherein Y is O; wherein R^1 is a linear or branched chain alkyl or arylalkyl group, or an aryl group; wherein R^2 is a trimethylsilyl, triethylsilyl, or t-butyldimethylsilyl group, or a linear or branched chain alkyl group; wherein R^3 is a linear or branched chain alkyl or alkylaryl group, or an aryl group; and wherein R^4 is H, a linear or branched chain alkyloxyalkyl group, a linear or branched chain alkyl or arylalkyl group, or an aryl group.

5,488,117
3-(ACYLOXYPHENYL)BENZOFURAN-2-ONE STABILISERS

Peter Nesvadba, Marly, Switzerland, assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

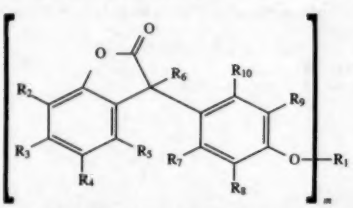
Division of Ser. No. 64,191, May 17, 1993, Pat. No. 5,369,159. This application Jul. 26, 1994, Ser. No. 280,420

Claims priority, application Switzerland, May 22, 1992, 1652/92

Int. Cl.[6] C07D *307/93;307/87;407/00*

U.S. Cl. 549—302 **5 Claims**

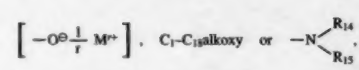
1. A compound of the formula (1)



(1)

in which R_2, R_3, R_4 and R_5, independently of one another, are hydrogen, C_1–C_{25}alkyl, C_7–C_9phenylalkyl, unsubstituted or C_1–C_4alkyl-substituted phenyl, unsubstituted or C_1–C_4alkyl-substituted C_5–C_8cycloalkyl; C_1–C_{18}alkoxy, hydroxyl, C_1–C_{25}alkanoyloxy, C_3–C_{25}alkenoyloxy, C_3–C_{25}alkanoyloxy which is interrupted by oxygen, sulfur or >N—R_{16}; C_6–C_9-cycloalkylcarbonyloxy, benzoyloxy or C_1–C_{12}alkyl-substituted benzoyloxy, where R_{16} is hydrogen or C_1–C_8alkyl,

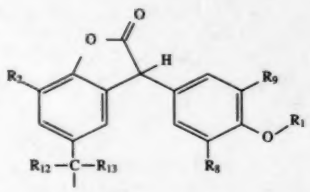
furthermore, the radicals R_2 and R_3 or the radicals R_4 and R_5 together with the carbon atoms to which they are bound form a phenyl ring, R_4 is additionally —$(CH_2)_n$—COR_{11}, in which n is 0, 1 or 2, R_{11} is hydroxyl,



C_1–C_{18}alkoxy or

R_{14} and R_{15}, independently of one another, are hydrogen or C_1–C_{18}alkyl, M is an r-valent metal cation and r is 1,2 or 3,

R_7, R_8, R_9 and R_{10}, independently of one another, are hydrogen, C_1–C_4alkyl or C_1–C_4alkoxy, with the proviso that at least one of the radicals R_7, R_8, R_9 and R_{10} is hydrogen and, in the case where R_3, R_5, R_6, R_7 and R_{10} are hydrogen, R_4 is additionally a radical of the formula (2)

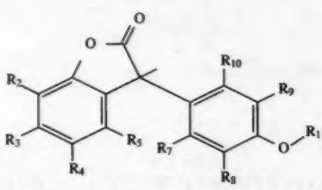


(2)

in which R_2, R_8 and R_9 are as defined above and R_1 is as defined below for when m=1, and R_{12} R_{13}, independently of one another, are hydrogen, C_1–C_{12}alkyl or phenyl,

m is 1 or 2, and,

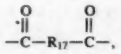
in the case where m is 1, R_1 hydrogen, C_1–C_{25}alkanoyl, C_3–C_{25}alkenoyl, C_3–C_{25}alkanoyl which is interrupted by oxygen, sulfur or N—R_{16}; C_6–C_9cycloalkylcarbonyl, benzoyl or C_1–C_{12}alkyl-substituted benzoyl, R_{16} is as defined above and R_6 is hydrogen or a radical of the formula (3)



(3)

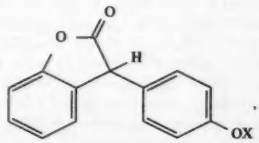
in which R_1, R_2, R_3, R_4, R_5, R_7, R_8, R_9 and R_{10} are as defined above, and,

in the case where m is 2, R_1



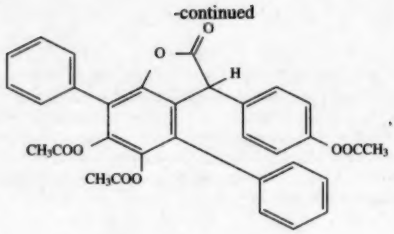
in which R_{17} is a direct bond, C_1–C_{18}alkylene, C_2–C_{18}alkylene which is interrupted by oxygen, sulfur or N—R_{16}; C_2–C_{18}alkenylene, C_2–C_{20}alkylidene, C_7–C_{20}phenylalkylidene, C_5–C_8cycloalkylene, C_7–C_8bicycloalkylene phenylene, R_{16} is as defined above and R_6 is hydrogen;

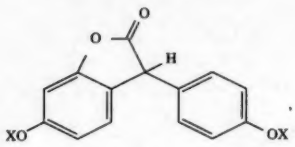
with the exclusion of the compounds of the formula (4) to (8)

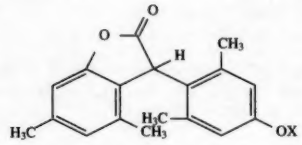


(4)

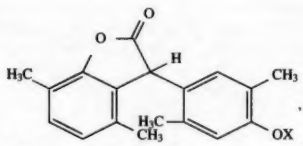
-continued







and



in which X is hydrogen or acetyl.

5,488,118

PROCESS FOR PRODUCING OPTICALLY ACTIVE ERYTHRO-3-AMINO-1,2-EPOXY COMPOUND

Taichi Koshigoe, Higashimatsuyama; Hitoshi Satoh, Saitama, and Kenichi Yamamoto, Yono, all of, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

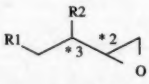
Filed Nov. 28, 1994, Ser. No. 345,074

Claims priority, application Japan, Dec. 6, 1993, 5-339158

Int. Cl.[6] C07D *301/00;303/36;* **C07C** *229/34*

U.S. Cl. 549—518 **20 Claims**

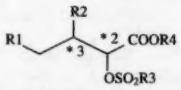
1. A process for producing an optically active erythro-3-amino-1,2-epoxy compound represented by the following general formula (3):



Formula (3)

wherein R1 represents a hydrocarbon residue having 3 to 12 carbon atoms; and R2 represents optionally protected amino, provided that when the carbon atom at the *3-position has an S configuration, then the carbon atom at the *2-position has an S configuration, and when the carbon atom at the *3-position has an R configuration, then the carbon atom at the *2-position has an R configuration, characterized by reducing an optically active threo-3-amino- 2-substituted butyrate derivative represented by the following general formula (1):

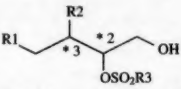
(5)



Formula (1)

wherein R1 and R2 are each as defined above; R3 represents a hydrocarbon residue having 1 to 12 carbon atoms; and R4 represents an ester residue, provided that when the carbon atom at the *3-position has an S configuration, then the carbon atom at the *2-position has an R configuration, and when the carbon atom at the *3-position has an R configuration, then the carbon atom at the *2-position has an S configuration, and then epoxidizing the obtained optically active threo-3-amino-2-substituted-1-butanol derivative represented by the following general formula (2):

(6)

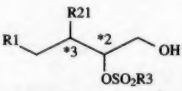


Formula (2)

wherein R1, R2, *2 and *3 are each as defined above, in the presence of a base to thereby give the target compound of the general formula (3).

(7)

12. An optically active threo-3-amino-2-substituted- 1-butanol derivative represented by the following general formula (4):



Formula (4)

wherein R1 represents a hydrocarbon residue having 3 to 12 carbon atoms; R21 represents an optionally protected amino except phthalimino; and R3 represents a hydrocarbon residue having 1 to 12 carbon atoms, provided that when the carbon atom at the *3-position has an S configuration, then the carbon atom at the *2-position has an R configuration, and when the carbon atom at the *3-position has an R configuration, then the carbon atom at the *2-position has an S configuration.

(8)

5,488,119

POLYMERISABLE PHOTOCHROMIC NAPHTHACENEDIONES, POLYMERS OF THESE MONOMERS, PROCESS FOR THEIR PREPARATION AND THE USE THEREOF

Evelyn Fischer-Reimann, Weil am Rhein, Germany, and Walter Fischer, Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

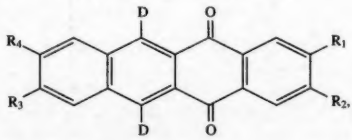
Filed Oct. 12, 1993, Ser. No. 135,775

Claims priority, application Switzerland, Jan. 15, 1992, 3216/92

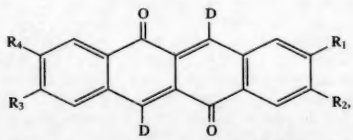
Int. Cl.[6] C07C *50/22;49/617*

U.S. Cl. 552—201 **20 Claims**

1. A compound of formula I and/or II



(I)



(II)

wherein D is H or —OR R is unsubstituted C_6–C_{14}aryl or C_1–C_{14}aryl which is substituted by C_1–C_{12}alkyl, C_1–C_{12}alkoxy,

C_1–C_{12}alkylthio, C_1–C_{12}alkylsulfinyl, C_1–C_{12}alkylsulfonyl, phenyl, benzyl, phenylsulfinyl, benzylsulfinyl, phenylsulfonyl, benzylsulfonyl, —CN, $—CF_3$, halogen, $—SO_3R_7$, —CO-R_7, $—CO_2R_7$, $—CON(R_8)_2$, $—N(R_8)_2$, or a group of formula III, with the proviso that both D are not H; R_1, R_2, R_3 and R_4 are each independently of the other H, C_1–C_{18}alkyl, C_1–C_{18}alkoxy, C_1–C_{18}alkylthio, C_1–C_{18}alkylsulfinyl, C_1–C_{18}alkylsulfonyl, phenyl, benzyl, phenylthio, benzylthio, phenylsulfinyl, benzylsulfinyl, phenylsulfonyl, benzylsulfonyl, —CN, $—CF_3$, halogen, $—SO_3R_7$, $—CO_2R_7$, $—CO_2R_7$, $—CON(R_8)_2$ $—N(R_8)_2$; or a group of formula III;

R_7 is H, C_1–C_{18}alkyl, cyclohexyl, cyclopentyl, phenyl, C_1–C_{12}alkylphenyl, benzyl or C_1–C_{12}alkylbenzyl; and

the R_8 substituents are each independently of the other H, C_1–C_{18}alkyl, cyclohexyl, cyclopentyl, phenyl, C_1–C_{12}alkylphenyl, benzyl, C_1–C_{12}alkylbenzyl, or one R_8 is H and the other R_8 is the —CO-R_9 group, wherein R_9 independently has the meaning of R_7, or both R_8 substituents, taken together, are tetramethylene, pentamethylene, 3-oxa-1,5-pentylene or the radical of formula $—CH_2CH_2$-$N(C_1$–C_6alkyl)CH_2CH_2—, with the proviso that one and only one group of formula III

$$E—CR_5=C(R_6)_2 \qquad \text{(III)}$$

is present wherein E is a direct bond or —X-C(O)— wherein X is a linking group, and R_5 and R_6 are each independently of the other H, halogen, C_1–C_{12}alkyl or C_6–C_{10}aryl.

5,488,120
1α-HYDROXY VITAMIN D_4 AND NOVEL INTERMEDIATES AND ANALOGUES

Joyce C. Knutson, Madison; Charles W. Bishop, Verona, both of Wis., and Robert M. Moriarty, Oak Park, Ill., assignors to Lunar Corporation, Madison, Wis.

Continuation of Ser. No. 991,493, Dec. 17, 1992, abandoned, which is a continuation of Ser. No. 800,045, Nov. 29, 1991, abandoned, which is a continuation of Ser. No. 586,854, Sep. 21, 1990, abandoned. This application Aug. 24, 1994, Ser. No. 296,084

Int. Cl.[6] C07C *401/00*

U.S. Cl. 552—653 **1 Claim**

1. 1α-hydroxy Vitamin D_4.

5,488,121
DI-GUERBET ESTERS

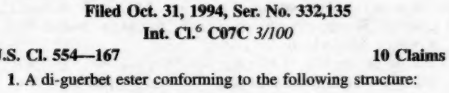
Anthony J. O'Lenick, Jr., Lilburn, Ga., assignor to Siltech Inc., Norcross, Ga.

Filed Oct. 31, 1994, Ser. No. 332,135

Int. Cl.[6] C07C *3/100*

U.S. Cl. 554—167 **10 Claims**

1. A di-guerbet ester conforming to the following structure:



wherein

a, b, c and d are independently integers ranging from 4 to 20.

5,488,122
ALKYL SUBSTITUTED METAL ALKYLALKOXYHYDROBORATE REDUCING AGENTS, AND PROCESSES FOR PRODUCTION AND USE OF THE SAME

Thomas C. Jackson, Seattle, Wash., assignor to Complex Chemicals, Corp., Seattle, Wash.

Filed Apr. 8, 1993, Ser. No. 45,466

Int. Cl.[6] C07F *5/02*

U.S. Cl. 556—8 **8 Claims**

1. A process for producing an alkyl substituted metal hydroborate reducing agent of the formula $X_iM[R_lR_mB(AR_jR_k)_{p+1-r}H_r]_{n-i}$ comprising: reacting an alkylborane having the formula $R_lR_mBH_p$ with greater than 10%, based on the molar content of the alkylborane, of a metal salt of the formula $X_iM(AR_jR_k)_{n-i}$, wherein:

X is a halogen, wherein the halogen is selected from the group consisting of fluorine, chlorine, bromine, iodine, and astatine;

M is a metal;

A is selected from the group consisting of oxygen, sulfur and nitrogen;

R_j, R_k, R_l, and R_m are each hydrocarbons selected from the group consisting of hydrogen, C1–C24 alkyl, aryl, arylalkyl, monocyclic, polycyclic, and heterocyclic radicals, wherein R_j and R_k may share a covalent bond, and R_l and R_m may share a covalent bond;

i equals an integer between 0 and 2;

n equals an integer between 1 and 4, provided that i and n are limited by the valence of the metal;

j and k each equal an integer between 0 and 1, provided that the sum of j and k is at least 1;

l and m each equal an integer between 0 and 1, provided that the sum of l and m is at least 1 when A is oxygen:

p equals 3 minus the sum of l and m; and

r equals an integer between 0 and 3.

2. A process for producing an alkyl substituted metal hydroborate reducing agent of the formula $X_iM[R_lR_mB(AR_jR_k)_{p+1-r}H_r]_{n-i}$ comprising: reacting an alkylborane having the formula $R_lR_mBH_p$ with greater than 10%, based on the molar content of the alkylborane, of a metal salt of the formula $X_iM(AR_jR_k)_{n-i}$, wherein:

X is a halogen;

M is a metal;

A is oxygen;

R_j, R_k, R_l, and R_m are each hydrocarbons selected from the group consisting of hydrogen, C1–C24 alkyl, aryl, arylalkyl, monocyclic, polycyclic, and heterocyclic radicals, wherein R_j and R_k may share a covalent bond, R_l and R_m may share a covalent bond;

i equals an integer between 0 and 2;

n equals an integer between 1 and 4, provided that i and n are limited by the valence of the metal;

j and k each equal an integer between 0 and 1, provided that the sum of j and k is at least 1;

l and m each equal an integer between 0 and 1, provided that the sum of l and m is at least 1 when A is oxygen;

p equals 3 minus the sum of l and m; and

r equals an integer between 0 and 3, wherein the process yields an alkyl substituted metal hydroborate reducing agent selected from the group consisting of lithium 9-boratabicyclo[3.3.1]-nonane, lithium 9,9-dimethoxy-9-boratabicyclo-[3.3.1]-nonane, dichloroaluminum disiamylborohydride, dichloroaluminum disiamyldi-isopropoxyborate, lithium methylborohydride, lithium methyltrimethoxyborate, sodium thexylmonoisopropoxyborohydride, sodium thexyldiisopropoxyborohydride, sodium thexyltriisopropoxyborohydride, sodium thexylborohydride, sodium diisopinocampheyldicycohexoxyborate, sodium diisopinocampheylborohydride, bromomagnesium phenylborohydride, bromomagnesium phenylmonothexoxy-borohydride, bromomagnesium phenyldithexoxyborohydride, bromomagnesium phenyltrithexoxyborate, zinc monoisopinocampheylborohydride, zinc

monoisopinocampheyltriethoxyborate, magnesium dicyclohexylborohydride, and magnesium dicyclohexyldinhexoxyborate.

5,488,123

POLYCONDENSATES CONTAINING POLYSILOXANE GROUPS

Fritz Engelhardt, Frankfurt am Main; Jürgen Kühlwein, Heusenstamm; Wilfried Schuler, Limburg; Ralf Zerrer, Alzenau, and Werner Antwerpen, Schwalbach/Ts., all of, Germany, assignors to Cassella AG, Frankfurt, Germany

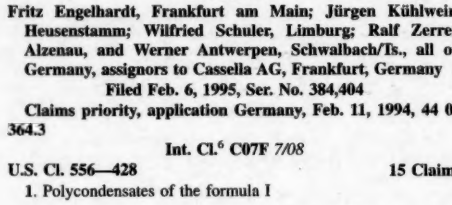
Filed Feb. 6, 1995, Ser. No. 384,404

Claims priority, application Germany, Feb. 11, 1994, 44 04 364.3

Int. Cl.[6] C07F *7/08*

U.S. Cl. 556—428 **15 Claims**

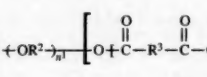
1. Polycondensates of the formula I



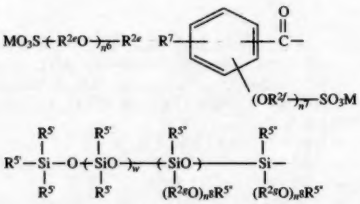
(I)

in which

X denotes



R^1 and $R^{1'}$ independently of one another denote hydrogen, (C_1–C_{22})-alkyl, (C_2–C_{22})-alkenyl, (C_3–C_8)cycloalkyl, (C_6–C_{14})-aryl, (C_6–C_{14})-aryl-(C_1–C_8)-alkyl, MO_3S—R^6—, MO_3S—,



R^2 to R^{2g} independently of one another denote (C_1–C_{30})-alkylene, (C_3–C_8)-cycloalkylene and/or (C_2–C_{30})-alkenylene, each of which can be substituted by a radical R^1;

R^3 and $R^{3'}$ independently of one another denote (C_1–C_{22})-alkylene, (C_3–C_8)-cycloalkylene, (C_2–C_{22})-alkylenylene and/or (C_6–C_{14})-arylene, where 0 to 30% of all the radicals R^3 and $R^{3'}$ carry an —SO_3M substituent;

R^4 denotes (C_1–C_{30})-alkylene, (C_3–C_8)-cycloalkylene or (C_2–C_{30})-alkenylene;

R^5, $R^{5'}$ and $R^{5''}$ independently of one another denote hydrogen, (C_1–C_{30})-alkyl, (C_3–C_8)-cycloalkyl or (C_2–C_{30})-alkenyl;

R^6 is defined as R^3, but independently of this;

R^7 denotes (C_1–C_{22})-alkyl, (C_3–C_8)-cycloalkyl or (C_2–C_{22})-alkenyl, where 0 to 30% of all the radicals R^7 carry an —SO_3M substituent;

M is hydrogen, an alkali metal, the ammonium group or a substituted ammonium group;

n^1 to n^8 independently of one another denote an integer from 0 to 40;

p and q independently of one another denote an integer from 2 to 20;

s denotes 0 or 1;

t denotes an integer from 0 to 80;

w denotes an integer from 0 to 80;

v denotes an integer from 0 to 80 and

y denotes an integer from 1 to 20.

5,488,124

ALKYLPOLYETHER SILOXANES

Vicky S. Cobb, Elsie; Beth I. Gutek, Freeland, and Gary E. Le Grow, Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Feb. 13, 1995, Ser. No. 387,515

Int. Cl.[6] C07F *7/08*

U.S. Cl. 556—445 **17 Claims**

1. Compounds selected from the group consisting of $RSi(OSiMe_2Q)_3$ and $(QMe_2SiO)_2$—Si(R)—O—Si(R)—$(OSiMe_2Q)_2$, wherein Me is methyl; R is a C_2 to C_{18} straight-chain or branched-chain alkyl substituent; and Q is a radical containing oxyethylene groups, oxypropylene groups, oxybutylene groups, or combinations of oxyethylene groups, oxypropylene groups, and oxybutylene groups.

5,488,125

METHOD FOR MANUFACTURING ORGANOSILANES HAVING SILANOL GROUPS

Naoki Omura, Akron, Ohio; Minoru Igarashi, Gunma, Japan; Yoshio Inoue, Gunma, Japan, and Masaharu Takahashi, Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1995, Ser. No. 392,116

Claims priority, application Japan, Feb. 23, 1994, 6-049820

Int. Cl.[6] C07F *7/08*

U.S. Cl. 556—463 **17 Claims**

1. A method for manufacturing organosilanes having silanol groups comprising: mixing an organoalkoxy silane, having at most a 20 ppm content of chlorine, expressed by the chemical formula (1) below:

$$Si(R^1)_m(R^2)_n(OR^3)_k \quad (1)$$

wherein each of R^1 and R^2 is independently either a substituted or unsubstituted monovalent hydrocarbon group; R^3 is an alkyl group of 1 to 4 carbon atoms; subscripts m and n are 0, 1, 2, or 3; k is either 1 or 2; and the sum of subscripts m+n+k=4, with ion-exchanged water having an electroconductivity of at least 10^{10}MΩ, then further adding a macro-porous cation-exchange resin, with a pore volume measured by the mercury injection method of at least 0.1 ml/g, to the mixture, stirring the mixture, removing the cation-exchange resin from the mixture and recovering an organosilane with at least one terminal silanol group.

5,488,126

BIFUNCTIONAL CHELATING AGENTS

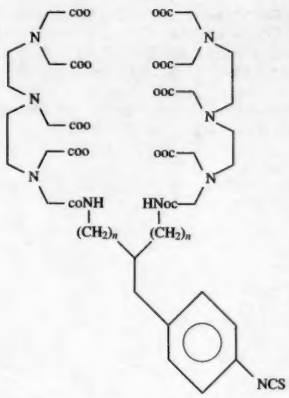
Ramaswamy Subramanian, Frederick, Md., and James L. Colony, Seattle, Wash., assignors to Akzo Nobel N.V., Arnhem, Netherlands

Division of Ser. No. 44,875, Apr. 8, 1993, Pat. No. 5,292,868, which is a continuation of Ser. No. 720,277, Jun. 24, 1991, abandoned, which is a continuation of Ser. No. 438,558, Nov. 17, 1989, abandoned, which is a continuation-in-part of Ser. No. 358,917, May 26, 1989, abandoned. This application Feb. 16, 1994, Ser. No. 197,086

Int. Cl.[6] C07C *331/28*

U.S. Cl. 558—17 **3 Claims**

1. A chelating agent having the formula:



wherein n is 1 or 2.

5,488,127

AMINOPHENOLS USEFUL AS INTERMEDIATES FOR FORMAZAN REACTIVE DYES

Claus Marschner, Speyer, and Manfred Patsch, Wachenheim, both of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

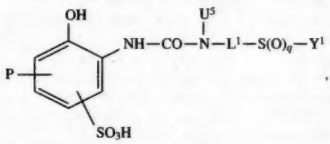
Division of Ser. No. 136,131, Oct. 15, 1993, Pat. No. 5,446,193. This application Mar. 22, 1995, Ser. No. 407,956

Claims priority, application Germany, Jan. 16, 1992, 42 34 900.1

Int. Cl.[6] C07C *317/28*

U.S. Cl. 558—25 **1 Claim**

1. An Aminophenol of the formula II



(II)

where

q is 0 or 2,

Y^1 is vinyl or a radical of the formula C_2H_4—Q^1, wherein Q^1 is a group that is detachable under alkaline reaction conditions or hydroxyl,

L^1 is C_2–C_6-alkylene, which may be substituted by hydroxyl, chlorine, cyano, carboxyl, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkanoyloxy or sulfato and may be interrupted by 1 or 2 oxygen atoms in ether function or by imino or C_1–C_4-alkylimino groups,

U^5 is hydrogen or C_1–C_6-alkyl, which may be substituted by hydroxyl, C_1–C_4-alkoxy, halogen, cyano, hydroxysulfonyl or a radical of the formula —SO_2—Y^1, wherein Y^1 is as defined above, or is substituted or unsubstituted phenyl, and

P is nitro or amino.

5,488,128

MONOMER FOR HIGH REFRACTIVE INDEX PLASTICS

Martina Bader, Griesheim, and Volker Kerscher, Reinheim, both of, Germany, assignors to Roehm GmbH Chemische Fabrik, Darmstadt, Germany

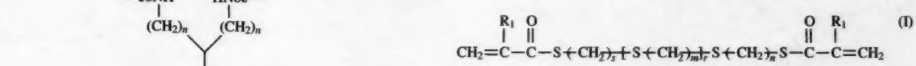
Filed Oct. 12, 1993, Ser. No. 134,738

Claims priority, application Germany, Jan. 10, 1992, 42 34 253.8

Int. Cl.[6] C07C *327/36*

U.S. Cl. 558—251 **6 Claims**

1. A thio(meth)acrylic acid bisester of the formula I



(I)

wherein R_1 represents hydrogen or methyl;

r represents the number 0 or 1; and

s, m, and n each independently represents an integer from 2 to 6, with the proviso that

when r=0, s+n>4; and

when r=1, s+m+n>6.

5,488,129

HYDROCYANATION OF OLEFINICALLY UNSATURATED NITRILES INTO DINITRILE COMPOUNDS

Marc Huser, Villeurbanne, and Robert Perron, Charly, both of, France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

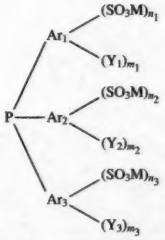
Filed Nov. 3, 1994, Ser. No. 335,349

Claims priority, application France, Nov. 3, 1993, 93 13306

Int. Cl.[6] C07C *253/10*

U.S. Cl. 558—338 **28 Claims**

1. A process for the hydrocyanation of an ethylenically unsaturated aliphatic mono-nitrile comprising contacting at least one such ethylenically unsaturated aliphatic mono-nitrile with hydrogen cyanide, in an aqueous reaction medium which comprises a catalytically effective amount of a three-component catalyst composition comprising (1) a transition metal; (2) a sulfonated phosphine said sulfonated phosphine having the general formula (I):



(I)

in which Ar_1, Ar_2 and Ar_3, which may be identical or different, are each aryl radicals; Y_1, Y_2 and Y_3, which may be identical or different, are each an alkyl radical having from 1 to 4 carbon atoms, an alkoxy radical having from 1 to 4 carbon atoms, a halogen atom, a CN group, an NO_2 group, an OH group, or a radial NR_1R_2 wherein R_1 and R_2, which may be identical or different, are each an alkyl radical having from 1 to 4 carbon atoms; M is an inorganic or organic cation selected such that the compound of formula (I) is water-soluble; m_1, m_2 and m_3 are integers, which may be identical or different, ranging from 0 to 5; and n_1, n_2 and n_3 are integers, which may be identical or different, ranging from 0 to 3, one or more of these being greater than or equal to 1; and (3) one or more Lewis acids, under reaction conditions to form a dinitrile through hydrocyanation of the ethylenically unsaturated aliphatic mono-nitrile, and forming a dinitrile through catalytic hydrocyanation of said ethylenically unsaturated aliphatic mono-nitrile.

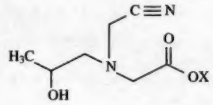
5,488,130

AMINO NITRILE INTERMEDIATE FOR THE PREPARATION OF 2-HYDROXYPROPYL IMINODIACETIC ACID

Phillip S. Athey; Druce K. Crump, both of Lake Jackson, and David A. Wilson, Richwood, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 31, 1995, Ser. No. 414,706
Int. Cl.[6] C07C *255/12;255/20;255/28*
U.S. Cl. 558—441 **1 Claim**

1. A compound represented by the following formula:



wherein X is hydrogen or an alkali or alkaline earth metal.

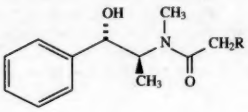
5,488,131

SYNTHESIS OF COMPOUNDS WITH PREDETERMINED CHIRALITY

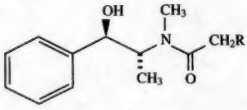
Andrew G. Myers, Pasadena, Calif., assignor to California Institute of Technology

Filed Mar. 23, 1994, Ser. No. 216,926
Int. Cl.[6] C07C *271/00;233/04*
U.S. Cl. 560—3 **3 Claims**

1. A compound of the formula



or



wherein R is a C_1–C_{14} straight or branched-chain alkyl group, a C_2–C_{14} straight or branched-chain alkenyl or alkynyl group, C_1–C_6 alkoxy, C_1–C_6 alkylthio, halo, hydroxy, heteroaryl, C_3–C_8 cycloalkyl, C_9–C_{16} bicycloalkyl, aryl or NR^1R^2 where R^1 and R^2 are each independently selected from the group consisting of hydrogen, C_1–C_6 straight or branched-chain alkyl, C_3–C_8 cycloalkyl, CO_2R^4 and $NHCO_2R^4$ where R^4 is C_1–C_{14} straight or branched-chain alkyl where the alkyl, alkenyl, alkynyl, alkoxy, alkylthio, heteroaryl, cycloalkyl, bicycloalkyl and aryl are optionally substituted with one or more groups independently selected from a C_1–C_{14} straight or branched-chain alkyl group, a C_2–C_{14} straight or branched-chain alkenyl or alkynyl group, halo, C_1–C_6 alkoxy, thio, C_1–C_6 alkylthio, NR^1R^2 where R^1 and R^2 are each independently selected from the group consisting of hydrogen, C_1–C_6 straight or branched-chain alkyl, C_3–C_8 cycloalkyl, CO_2R^6 and $NHCO_2R^4$ where R^4 is C_1–C_{14} straight or branched-chain alkyl, provided that R is not 1-(S)-methylpentyl or (R)-α-methylbenzyl.

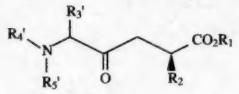
5,488,132

PROCESS FOR MAKING OPTICALLY ACTIVE ALPHA-AMINO KETONES AND SELECTED NOVEL OPTICALLY ACTIVE ALPHA-AMINO KETONES

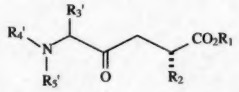
John J. Talley, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 898,853, Jun. 15, 1992, Pat. No. 5,364,961. This application Apr. 22, 1994, Ser. No. 232,786
Int. Cl.[6] C07C *229/00*
U.S. Cl. 560—39 **1 Claim**

1. A process comprising the treatment of a compound of the formula (III or III_1)



III



III_1

wherein

R_1 is hydrogen, alkyl lower cycloalkyl, or an aromatic group;

R_2 is CH_2R_9 wherein R_9 is

(a) hydrogen radical,

(b) alkyl of one to four carbon atoms optionally substituted with one or more substituents selected from the group consisting of hydroxyl, alkoxy of one to four carbon atoms, chloro and fluoro radicals,

(c) phenyl optionally substituted with one to three substituents selected from the group consisting of alkyl of one to four carbon atoms, fluoro, chloro, bromo, iodo, hydroxyl, nitro, alkoxy of one to four carbon atoms, and —CO—$N(R_7)_2$ radicals, wherein R_7 is hydrogen or alkyl radical of one to four carbon atoms,

(d) pyridyl, furyl, indolyl or benzisoxazolyl radical,

(e) cycloalkyl radical of one to seven ring members, or

(f) naphthyl radical;

R_3' is CHR_6R_8', wherein R_6 is

(1) hydrogen radical;

(2) alkyl radical of from one to six carbon atoms optionally substituted by one or two substituents selected from the group consisting of hydroxyl, chloro and fluoro radicals;

(3) cycloalkyl radical of from three to seven ring members;

(4) phenyl radical optionally substituted by one to three substituents selected from the group consisting of

(a) alkyl radical of from one to four carbon atoms,

(b) fluoro, chloro, bromo, and iodo radical,

(c) alkoxy radical of from one to three carbon atoms,

(d) nitro radical,

(e) amido radical,

(f) mono- and dialkyl substituted amido radical, wherein the alkyl group is from one to four carbon atoms, and

(g) hydroxy radical;

(5) tolyl radical;

(6) tolyl radical substituted by one to three substituents selected from the group consisting of

(a) alkyl radical of from one to four carbon atoms,

(b) fluoro, chloro, bromo, and iodo radical,

(c) alkoxy radical of from one to three carbon atoms,

(d) nitro radical,

(e) amido radical,

(f) mono- and dialkyl substituted amido radical, wherein the alkyl group is from one to four carbon atoms, and

(g) hydroxy radical;

(7) naphthyl radical optionally substituted by one to three substituents selected from the group consisting of

(a) alkyl radical of from one to four carbon atoms,

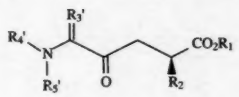
(b) fluoro, chloro, bromo, and iodo,

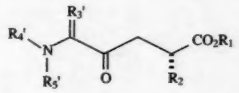
(c) alkoxy radical of from one to three carbon atoms,

(d) nitro radical,

(e) amido radical,

(f) mono- and dialkyl substituted amido radical, wherein the alkyl group is from one to four carbon atoms, and
(g) hydroxy radical; or
(8) indol-3-yl, indol-2-yl, or imidazol-4-yl, indol-3-ylmethyl, indol-2-ylmethyl or imidazol-4-ylmethyl radical;
(9) NHA wherein A is
(a) trityl radical,
(b) hydrogen radical,
(c) alkyl radical of from one to six carbon atoms,
(d) $R_{10}CO$ wherein R_{10} is (A) hydrogen radical, (B) alkyl radical of from one to six carbon atoms optionally substituted with hydroxyl, chloro, or fluoro radicals, (C) phenyl or naphthyl radical each of which is optionally substituted with one to three substituents selected from the group consisting of (i) alkyl radical of from one to three carbon atoms, (ii) fluoro, chloro, bromo and iodo radical, (iii) hydroxy radical, (iv) nitro radical, (v) alkoxy radical of from one to three carbon atoms, and (vi) $CON(R_{11})_2$ wherein each R_{11} is independently hydrogen or alkyl radical of from one to four carbon atoms, or (D) indolyl, pyridyl, furyl or benzisoxazolyl radical;
(e) phthaloyl radical, wherein the aromatic ring is optionally substituted by one to three substituents selected from the group consisting of (A) alkyl radical of from to three carbon atoms, (B) fluoro, chloro, bromo and iodo radical, (C) hydroxy radical, (D) nitro radical, (E) alkoxy radical of from one to three carbon atoms, and (F) $CON(R_{11})_2$ radical, wherein each R_{11} is independently hydrogen or alkyl radical of from one to four carbon atoms,
(f) $R_{12}(R_{13}R_{14}C)_mCO$ wherein m is one to three and R_{12}, R_{13} and R_{14} are each independently selected from the group consisting of (A) hydrogen radical, (B) chloro and fluoro radical, (C) alkyl radical of from one to three carbon atoms optionally substituted by chloro, fluoro, or hydroxy radicals (D) hydroxy radical, (E) phenyl or naphthyl radical each of which is optionally substituted by one to three substituents selected from the group consisting of (i) alkyl radical of from one to three carbon atoms, (ii) fluoro, chloro, bromo and iodo radical, (iii) hydroxy radical, (iv) nitro radical, (v) alkoxy radical of from one to three carbon atoms, and (vi) $CON(R_{11})_2$ wherein each R_{11} is independently hydrogen or alkyl radical of from one to four carbon atoms, (F) alkoxy radical of from one to three carbon atoms, (G) pyridyl, furyl, and benzisoxazolyl radical, and (H) R_{12}, R_{13} and R_{14} are independently joined to form a monocyclic, bicyclic, or tricycle ring system each ring of which is cycloalkyl of from three to six carbon atoms; except that only one of R_{12}, R_{13} and R_{14} can be hydroxy or alkoxy on the same carbon and are not hydroxy, chloro or fluoro when m is one;
(g) $R_{12}(R_{13}R_{14}C)_mW$ wherein m is one to three and W is OCO or SO_2 and R_{12}, R_{13} and R_{14} are each independently as defined above;
(h) $R_{20}W$ wherein R_{20} is pyridyl, furyl, indolyl or benzisoxazolyl radical;
(i) $R_{21}W$ wherein R_{21} is phenyl or naphthyl radical each of which is optionally substituted by one to three substituents selected from the group consisting of (i) alkyl radical of from one to three carbon atoms, (ii) fluoro, chloro, bromo and iodo radical, (iii) hydroxy radical, (iv) nitro radical, (v) alkoxy radical of from one to three carbon atoms, and (vi) $CON(R_{11})_2$ wherein each R_{11} is independently hydrogen or alkyl radical of from one to four carbon atoms;
(j) $R_{12}(R_{13}R_{14}C)_mP(O)(OR_{22})$ wherein R_{22} is alkyl radical of from one to four carbon atoms or phenyl;
(k) $R_{20}P(O)(OR_{22})$ wherein R_{20} and R_{22} are as defined above; or
(l) $R_{21}P(O)(OR_{22})$ wherein R_{21} and R_{22} are as defined above;
(10) $R_{12}(R_{13}R_{14}C)_mV$ wherein V is O or NH and R_{12}, R_{13} and R_{14} are each independently as defined above;
(11) $N(R_{11})_2$ wherein each R_{11} is independently as defined above;
(12) $NR_{15}R_{16}$ wherein R_{15} and R_{16} are joined to form azetidinyl, pyrrolidinyl , piperidinyl, or morpholinyl radical;
(13) $R_{17}OCH_{20}O$ wherein R_{17} is
(a) alkyl radical of from one to six carbon atoms,
(b) R_{21} wherein R_{21} is as defined above; or
(c) CH_2Q_1 wherein Q_1 is phenyl, naphthyl, pyridyl, furyl, indolyl or benzisoxazolyl radical;
(14) $R_{17}OCH_2CH_{20}OCH_2$ wherein R_{17} is as defined above;
(15) alkynyl radical of from two to six carbon atoms optionally substituted with R_{21} wherein R_{21} is as defined above; or
(16) alkenyl radical of from two to six carbon atoms optionally substituted with R_{21} wherein R_{21} is as defined above; and
R_8' is hydrogen, alkyl radical of from one to six carbon atoms or cycloalkyl radical of from one to seven ring members; and
R_4' is alkoxycarbonyl, phenoxycarbonyl, naphthyloxycarbonyl, phenylalkoxycarbonyl, naphthylalkoxycarbonyl, alkanoyl, formyl, phenylalkanoyl, naphthylalkanoyl, benzoyl, or naphthoyl radical, wherein each alkyl radical, alone or in combination, is from one to ten carbon atoms and wherein each phenyl or naphthyl group is optionally substituted by alkyl radicals; and
R_5' is hydrogen;
with tertiary-butyl hypochlorite and 1,4-diazabicyclo[2.2.2] octane to obtain a compound of the formula (II or II_1)


II


II_1

wherein R_1, R_2, R_4' , and R_5' are as defined above and R_3 is CR_6R_8'.

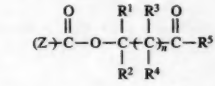
5,488,133

IODINATED AROYLOXY KETONES

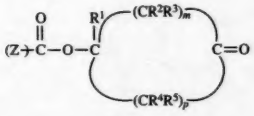
Baldev Singh, Collegeville; Edward R. Bacon, Audubon, and Shaughnessy Robinson, Gilbertsville, all of Pa., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 10, 1994, Ser. No. 209,181
Int. Cl.[6] C07C *229/56;* **A61K** *49/04*
U.S. Cl. 424—9.45 **8 Claims**

1. A compound having the structure



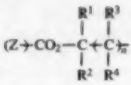
or



wherein (Z)COO is the residue of a triiodinated aromatic acid;
n is an integer from 0 to 20;
R^1, R^2, R^3 and R^4 are independently H, alkyl, fluoroalkyl, cycloalkyl, aryl, aralkyl, alkoxy, aryloxy, halogen, hydroxy,

acylamino, acetamidoalkyl, acetamidoaryl, —COO-alkyl, —COO-aryl, —COO-aralkyl, —CO-alkyl, —CO-aryl, or cyano;

R^5 is H, alkyl, fluoroalkyl, cycloalkyl, aryl,



aralkyl, alkoxyalkyl, or a group, wherein Z, R^1, R^2, R^3, R^4 and n are as defined above;

m is an integer from 0 to 10;

p is an integer from 0 to 10; and

m+p>1.

5,488,134

PREPARATION OF COMPOUNDS OF LIGNAN SERIES

Sachio Mori, Ashiya; Shozo Takechi, Higashiosaka, and Shiro Kida, Osaka, all of, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

PCT No. PCT/JP94/00612, § 371 Date Dec. 16, 1994, § 102(e) Date Dec. 16, 1994, PCT Pub. No. WO94/24087, PCT Pub. Date Oct. 27, 1994

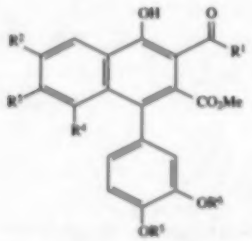
PCT Filed Apr. 12, 1994, Ser. No. 356,199

Claims priority, application Japan, Apr. 16, 1993, 5-089944

Int. Cl.[6] C07L *69/76*

U.S. Cl. 560—53 **9 Claims**

1. A process for preparing a compound represented by the formula (I)



(I)

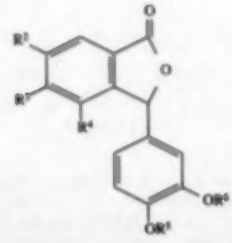
in which R^1 is alkyl, cycloalkyl, cycloalkyl-lower alkyl, aralkyl, or optionally-substituted aryl;

each of R^2 and R^3 is lower alkoxy or R^2 and R^3 are combined together to form an alkylenedioxy;

R^4 is lower alkoxy or hydrogen; and

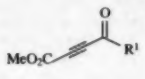
each of R^5 and R^6 is lower alkyl;

which process is characterized by that a lactone compound represented by the formula (II)



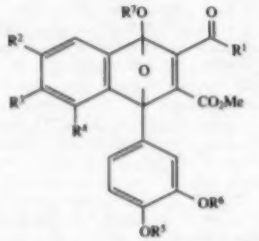
(II)

in which R^2, R^3, R^4, R^5, and R^6 are as defined above, is allowed to react with a compound of the formula: R^7Cl, wherein R^7 is tri(lower alkyl)silyl, in the presence of a base, then the resulting compound is subjected to addition reaction with an acetylenic compound of the formula (III)



(III)

in which R^1 is as defined above, to give a compound represented by the formula (IV)



(IV)

in which R^1, R^2, R^3, R^4, R^5, R^6 and R^7 are as defined above, which is then reduced.

5,488,135

BIS(PHENYL)ETHANE DERIVATIVES

Peter Nussbaumer, Maria Enzersdorf, and Anton Stutz, Vienna, both of, Austria, assignors to Sandoz Ltd., Switzerland

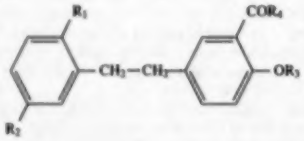
Filed Oct. 16, 1992, Ser. No. 962,370

Claims priority, application Austria, Jan. 16, 1991, 9121943

Int. Cl.[6] C07C *69/76;* **A01N** *37/10*

U.S. Cl. 560—266 **8 Claims**

1. A compound of formula I



I

wherein

R_1 and R_2 independently are alkoxy,

R_3 is hydrogen or acyl, and

R_4 is alkoxy,

in free form or, where such forms exist, in salt form.

5,488,136

PROCESS FOR THE RACEMIZATION OF NONRACEMIC 3-OXYOCYLOPENTANE- OR -HEXANECARBOXYLIC ACIDS OR THEIR ESTERS WITH C_1-C_6-ALCOHOLS

Rainer Sobotta, Ingelheim, Germany, assignor to Boehringer Ingelheim KG, Ingelheim am Rhein, Germany

PCT No. PCT/EP91/01434, § 371 Date Apr. 16, 1993, § 102(e) Date Apr. 16, 1993, PCT Pub. No. WO92/02483, PCT Pub. Date Feb. 29, 1992

PCT Filed Jul. 31, 1991, Ser. No. 971,775

Claims priority, application Germany, Aug. 4, 1990, 40 24 836.4

Int. Cl.[6] C07C *69/74*

U.S. Cl. 560—122 8 Claims

1. A process for the racemization of non-racemic 3-oxocyclopentanecarboxylic acid and 3-oxocyclohexanecarboxylic acid and their corresponding esters with C_1–C_6 alcohols which comprises:

a) esterifying starting acid material with an orthoformic acid ester of a C_1–C_6 alcohol in the presence of a catalytical amount of a strong acid;

b) ketalizing the resulting ester with an orthoformic acid ester of a C_1–C_6 alcohol in the presence of a strong acid;

c) racemizing the resulting ketal by means of a sodium or potassium alkoxide of a C_1–C_6 alcohol;

d) hydrolysing the resulting material by treatment with dilute acid to form the racemic acid; and

e) isolating the resulting racemic acid or the resulting racemic ester.

5,488,137

ACRYLIC ACID ESTER DERIVATIVE HAVING A TRIPHENYL AMINE SKELETON

Hiroshi Tamura, Susono; Toshio Fukagai; Naoshi Mishima, both of Numazu, and Masaomi Sasaki, Susono, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

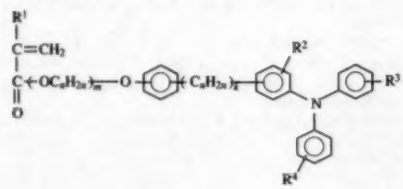
Division of Ser. No. 912,200, Jul. 13, 1992, Pat. No. 5,322,753. This application Mar. 22, 1994, Ser. No. 215,606

Claims priority, application Japan, Jul. 12, 1991, 3-198898

Int. Cl.[6] C07C *69/533*

U.S. Cl. 560—141 2 Claims

1. An acrylic acid ester of the formula



wherein R^1 represents hydrogen or a methyl group; R^2, R^3 and R^4 each represent hydrogen, an alkyl group having 1 to 4 carbon atoms, a benzyl group, a phenyl group or chlorine; n is an integer of 1 to 4; m is 0 or 1; and k is 0 or 1.

5,488,138

PROCESS FOR PRODUCING HIGHLY PURE CARBOXYLIC ACID PHENYL ESTERS

Itaru Nitta, Tsukuba, and Kuniaki Asai, Tondabayashi, both of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

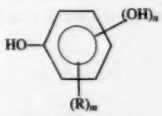
Continuation of Ser. No. 852,210, Jun. 4, 1992, abandoned. This application Aug. 22, 1994, Ser. No. 293,425

Claims priority, application Japan, Jan. 8, 1990, 2-271012

Int. Cl.[6] C07C *69/017*

U.S. Cl. 560—144 6 Claims

1. A process for producing a highly pure carboxylic acid phenyl ester by reacting an aromatic hydroxy compound having the formula (I),



(I)

wherein R is halogen, alkyl having 1–5 carbon atoms, or phenyl; and m and n are each an integer of 0–2, provided that when m is 2, two substituents represented by R may be different from each other,

with a carboxylic acid anhydride, characterized by conducting the reaction in the presence of 0.02 to 3 parts by weight of a tertiary amine per 100 parts by weight of the aromatic hydroxy compound.

5,488,139

PAPER OPACIFYING COMPOSITION

Louis R. Dragner, and Bernard F. North, both of Rock Hill, S.C., assignors to Sequa Chemicals, Inc., Chester, S.C.

Filed Jun. 24, 1994, Ser. No. 265,402

Int. Cl.[6] C07C *229/24;67/587*

U.S. Cl. 560—155 26 Claims

1. A composition for adding to a pulp slurry of cellulose fibers during a papermaking process for enhancing opaqueness in the paper produced therefrom comprising the reaction products formed from the reaction of a dimerized acid and an alkanol amine and wherein said composition further includes a surfactant wherein the dimerized acid is a dimer of a poly unsaturated acid selected from the group consisting of tall oil acid, soybean oil acid, palm oil acid, linolenic acid, eleostearic acid and mixtures thereof.

5,488,140

4-SUBSTITUTED 2-AMINOALK-3-ENOIC

Christof Angst, Möhlin, Switzerland; Hans Allgeier, Lörrach, Germany; Roland Heckendorn, Arlesheim, and Daniel Wallach, Basel, both of, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

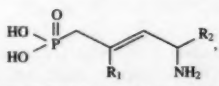
Continuation of Ser. No. 169,687, Dec. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 851,437, Mar. 16, 1992, Pat. No. 5,294,734, which is a continuation-in-part of Ser. No. 586,352, Sep. 21, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 483,628

Claims priority, application Switzerland, Sep. 26, 1989, 3479-89

Int. Cl.[6] C07C *229/30;* C07F *9/38;* A61K *31/66*

U.S. Cl. 560—170 20 Claims

1. A substituted 2-aminoalk-3-enoic acid derivative of formula I



(I)

wherein R_1 is an aliphatic hydrocarbon radical that is substituted by hydroxy, and R_2 is free or esterified carboxy, or a salt thereof.

5,488,141

REMOVAL OF CARBONYL IMPURITIES FROM αβ UNSATURATED CARBOXYLIC ACID ESTERS

William Bauer, Jr., Huntingdon Valley; Nelson I. Quiros, Telford, and Rita K. Upmacis, North Wales, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jun. 10, 1994, Ser. No. 258,011

Int. Cl.[6] C07C *69/74*

U.S. Cl. 560—218 12 Claims

1. A process for removing carbonyl-containing impurities from an α,β-unsaturated carboxylic acid ester comprising the steps of:

a. effectively admixing the ester and an aqueous solution of a salt selected from bisulfites and dithionites; and

b. separating the ester from the aqueous solution.

5,488,142

FLUORINATION IN TUBULAR REACTOR SYSTEM

David J. Fall, Croix, Wis., and Miguel A. Guerra, Washington, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 4, 1993, Ser. No. 130,764

Int. Cl.[6] C07C *69/63*

U.S. Cl. 560—227 13 Claims

1. A process for making fluorinated organic substances which comprises:

(A) providing a reaction system comprising a reactor consisting essentially of a tubular reactor and a means for conveying fluids through the reactor;

(B) adding to the reaction system upstream of the tubular reactor an organic feed which can be fluorinated;

(C) conveying through the tubular reactor a fluid stream comprising the organic feed and an inert liquid medium;

(D) introducing into the fluid stream of C fluorine gas, the ratio of organic feed to fluorine being sufficient to obtain a chemical reaction between them; and

(E) fluorinating the organic feed in turbulent flow conditions in which the Reynolds number of the fluid stream is at least 3,000 and for a time sufficient to yield fluorinated product.

5,488,143

PROCESSES FOR THE CARBONYLATION OF METHANOL TO FORM ACETIC ACID, METHYL ACETATE AND ACETIC ANHYDRIDE

Sung J. Uhm, Seoul; Sung H. Han, Seongnam-shi; Jun W. Oh, and Oh S. Joo, both of Seoul, all of, Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea

Continuation-in-part of Ser. No. 175,577, Dec. 30, 1993, abandoned, which is a division of Ser. No. 81,107, Jun. 25, 1993, abandoned, and Ser. No. 174,263, Dec. 28, 1993. This application Jan. 19, 1994, Ser. No. 183,344

Claims priority, application Rep. of Korea, Jun. 30, 1992, 92-11524; Jan. 30, 1992, 92-20188; Dec. 23, 1992, 92-25281; Jul. 27, 1993, 92-14265

Int. Cl.[6] C07C *67/36;53/08;51/12*

U.S. Cl. 560—232 52 Claims

1. A process for treating an industrial gas containing metallic carbonyl compounds which comprises contacting said industrial gas with iodine vapor to thereby convert the metallic carbonyl compounds to one or more than one metallic iodide.

5,488,144

BIFUNCTIONAL AROMATIC CYANATES, PREPOLYMERS AND ELECTRICAL LAMINATES MADE THEREFROM

Hidenari Tsunemi, Adegawacho, and Toshinobu Nakata, Otsu, both of, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

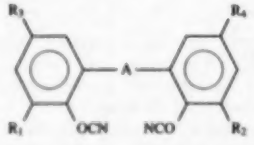
Division of Ser. No. 996,754, Dec. 24, 1992, abandoned. This application Apr. 15, 1994, Ser. No. 228,170

Claims priority, application Japan, Dec. 27, 1991, 3-359938; Feb. 26, 1992, 4-075148

Int. Cl.[6] C07C *261/02*

U.S. Cl. 560—301 4 Claims

1. A dicyanate ester of the formula:



wherein R_1, R_2, R_3 and R_4 are the same or different and each is hydrogen, alkyl, perfluoroalkyl, aryl or halogen;

and A is a methylene, mono- or dialkyl substituted methylene, or oxy, bridge,

with the proviso that when A is methylene, R_1, R_2, R_3 and R_4 are not simultaneously hydrogen.

5,488,145

2,4-DISULFONYL PHENYL BUTYL NITRONE, ITS SALTS, AND THEIR USE AS PHARMACEUTICAL FREE RADICAL TRAPS

John M. Carney, Lexington, Ky., assignor to Oklahoma Medical Research Foundation, Oklahoma City, Okla., and University of Kentucky Research Foundation, Lexington, Ky.

Filed Dec. 23, 1993, Ser. No. 173,579

Int. Cl.[6] A61K *31/185*

U.S. Cl. 562—62 12 Claims

1. 2,4-disulfonyl α-phenyl tertiary butyl nitrone.

5,488,146

PROCESS FOR THE PREPARATION OF SULFO CARBOXYMETHYLOXYSUCCINIC ACID AND ITS SALTS

Eddie N. Gutierrez, Midland Park, and Shang-Ren Wu, Mahwah, both of N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Dec. 22, 1994, Ser. No. 362,357

Int. Cl.[6] C07C *303/32*

U.S. Cl. 562—109 8 Claims

1. A process for preparing SCMOS acid comprising:

(i) reacting

(a) maleic anhydride with;

(b) SO_3 in a ratio of 1.1 to 1.3 moles of SO_3 to 1.0 moles of said maleic anhydride species to form a sulfo malic anhydride mixture;

maintaining the temperature of said mixture at C. to 80° C. and adding cold water and ice to a temperature of 25° C. to 30° C. to form sulfomaleic acid;

(iii) adding glycolic acid to said sulfomaleic acid to form an acid mixture;

(iv) adding an alkaline earth metal hydroxide or a mixture of alkaline earth metal and alkali metal hydroxides to a pH of about 11 and at a temperature of about 25° C to 50° C. to form sulfocarboxymethyloxy succinic acid (SCMOS) alkaline earth metal salts;

(v) precipitating out said salts and recovering said salts as the pH drops to 10.2–10.5;
(vi) washing said salts with water to solubilize impurities; and
(vii) converting said salts to sodium salts by the use of a material selected from the group consisting of ion exchange resin, sodium carbonate and mixtures thereof.

5,488,147

DIARYLIODONIUM FLUOROALKYL SULFONATE SALTS AND A METHOD OF MAKING

Dennis E. Vogel, and Kim M. Vogel, both of Lake Elmo, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jul. 21, 1994, Ser. No. 278,139
Int. Cl.[6] C07C *303/32*
U.S. Cl. 562—113 **16 Claims**

1. A method of making a diaryliodonium fluoroalkyl sulfonate salt consisting essentially of the steps of:
(a) forming a mixture consisting essentially of
(i) an aromatic compound which is optionally substituted with one or more groups selected from the groups consisting of electron-neutral groups, electron-donating groups, and combinations thereof, wherein the aromatic compound has at least one pendant —H, and wherein said aromatic compound is unreactive with a fluoroalkyl sulfonic acid(s) of element (b);
(ii) an anhydride selected from the group compsisting of aliphatic anhydrides, alicyclic anhydrides, and mixtures thereof, wherein the anhydride is optionally substituted with one or more groups unreactive with the fluoroalkyl sulfonic acid(s) of element (b), and wherein the anhydride is derived from an acid having a pka of greater than about 4.2;
(iii) an alkali metal salt of iodic acid; and
(iv) optionally, a solvent which is unreactive with elements (i) to (iii);
(b) adding to the mixture, with agitation, the fluoroalkyl sulfonic acid of the formula R^{11}—CF_2—SO_3H, wherein R^{11} is selected from the group consisting of alkyl groups, chlorofluoroalkyl groups, chlorinated alkyl groups, and fluorinated alkyl groups, wherein the fluoroalkyl sulfonic acid is optionally dissolved in a solvent which is unreactive with the fluoroalkyl sulfonic acid, such that reaction occurs but at a rate and a temperature selected to prevent an uncontrolled exothermic reaction;
(c) allowing the reaction to continue, with agitation, at a temperature selected to prevent uncontrolled exothermic reaction, to form diaryliodonium fluoroalkyl sulfonate salt.

5,488,148

PROCESS FOR SULFONATING INTERNAL OLEFINS

Upali Weerasooriya, Austin; John Lin, Cedar Park; K. Lee Matheson, Austin; Donald T. Robertson, Austin; Janet L. Watson, Austin, and LeAnn M. Rowe, Pflugerville, all of Tex., assignors to Vista Chemical Company, Houston, Tex.

Filed Sep. 1, 1993, Ser. No. 115,313
Int. Cl.[6] C07C *309/20*
U.S. Cl. 562—123 **9 Claims**

1. A process for sulfonating internal olefins comprising:
sulfonating a solution of internal olefins having the general formula:

$$R_1—CH=CH—R_2$$

wherein R_1 and R_2 may be the same or different and are each an alkyl group containing from about 1 to about 30 carbon atoms with a sulfonating agent in a hydrocarbon solvent that is substantially inert under sulfonation conditions and does not deleteriously affect sulfonation of said internal olefins to produce a reaction mixture containing intermediate sulfonated compounds, said internal olefins being present in said solvent in an amount of from about 5 to about 40% by weight;
neutralizing said intermediate sulfonated compounds in said reaction mixture under conditions to form neutralized sulfonated compounds;
hydrolyzing said neutralized sulfonated compounds in said reaction mixture under conditions to form a product mixture containing hydroxy alkane sulfonates and alkene sulfonates; and
recovering said product mixture from said solution.

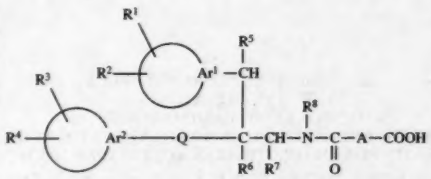
5,488,149

SUBSTITUTED AMIC ACID DERIVATIVES

Takashi Nomoto; Masahiro Hayashi; Jun Shibata; Yoshikazu Iwasawa; Morihiro Mitsuya; Yoshiaki Iida; Katsumasa Nonoshita, and Yasufumi Nagata, all of Tsukuba, Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan

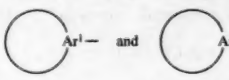
Continuation of Ser. No. 193,850, Feb. 9, 1994, abandoned.
This application Jun. 6, 1995, Ser. No. 471,081
Claims priority, application Japan, Feb. 12, 1993, 5-047364; Sep. 24, 1993, 5-261713; Sep. 24, 1993, 5-261714
Int. Cl.[6] C07C *235/72*
U.S. Cl. 562—449 **19 Claims**

1. A compound of the formula (I) or its pharmaceutically acceptable salt or ester:

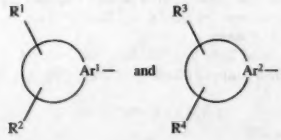


(I)

wherein each of



which are the same or different, is an aryl group or a heteroaromatic ring group; A is a C_{3-8} linear saturated or unsaturated aliphatic hydrocarbon group which may have substituent(s) selected from the group consisting of a lower alkyl group, a hydroxyl group, a lower alkoxy group, a carboxyl group, an aryl group and an aralkyl group; Q is a single bond or a group of the formula —CO—O—, —O—CO—, —CH_2CH_2—, —CH=CH—, —OCH_2—, —SCH_2—, —CH_2O— or —CH_2S—; each of R^1, R^2, R^3 and R^4 which are the same or different, is a hydrogen atom, a halogen atom, a lower alkyl group, a hydroxyl group, a lower alkoxy group, or an aryl or heteroaromatic ring group which may have substituent(s) selected from the group consisting of a halogen atom, a lower alkyl group and a lower alkoxy group; each of R^5, R^6 and R^7 which are the same or different, is a hydrogen atom or a lower alkyl group; and R^8 is a hydrogen atom a lower alkyl group, a lower alkenyl group, a lower alkynyl group or an aralkyl group, provided that when Q is a single bond,



are not simultaneously 4-chlorophenyl groups.

5,488,150

CRYSTALS OF N-(TRANS-4-ISOPROPYLCYCLOHEXYCARBONYL)-D-PHENYLALANINE AND METHODS FOR PREPARING THEM

Michito Sumikawa; Yoshihito Koguchi; Takao Ohgane; Yasuo Irie, all of Kawasaki, and Satoji Takahashi, Yottukaichi, all of, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation of Ser. No. 921,224, Jul. 29, 1992, abandoned. This application Dec. 14, 1993, Ser. No. 166,144

Claims priority, application Japan, Jul. 30, 1991, 3-189696; Aug. 8, 1991, 3-199453

Int. Cl.[6] C07C *239/00*

U.S. Cl. 562—450 **13 Claims**

1. A method for the production of crystals of N-(trans-4-isopropylcyclohexylcarbonyl)-D-phenylalanine having at least one of the following properties:

(a) a melting point in the range of 136°–142° C.;

(b) a powder X-ray diffraction pattern with reflection maxima at 2θ of about 8.1°, 13.1°, 19.6° and 19.9°; comprising dissolving or suspending N-(trans-4-isopropylcyclohexylcarbonyl)-D-phenylalanine in a solvent in which it is completely or incompletely soluble at a temperature of at least 10° C. and up to the boiling point of the solvent and permitting said crystals to crystallize from or form in said solvent at a temperature of 10° C. or in excess thereof.

5,488,151

{(7S)-7-[(2R)-2-(3-CHLOROPHENYL)-2-HYDROXYETHYLAMINO)-2-HYDROXYETHYLAMINO]05,6,7,8-TETRAHYDRONAPHTHALEN-2-YLOXY} ACETIC ACID AND ITS PHARMACEUTICALLY ACCEPTABLE SALTS

Marco Baroni, Vanzago; Roberto Cecchi, Lodi, and Tiziano Croci, Milan, all of, Italy, assignors to Sanofi, Paris, France

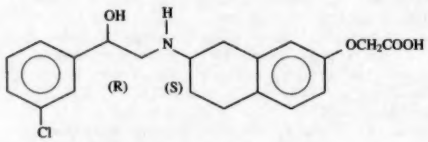
Filed May 31, 1994, Ser. No. 250,830

Claims priority, application European Pat. Off., May 28, 1993, 93401375

Int. Cl.[6] C07C *229/40*

U.S. Cl. 562—452 **11 Claims**

1. {(7S)-7-[(2R)-2-(3-Chlorophenyl)-2-hydroxyethylamino]-5,6,7,8-tetrahydronaphthalen-2-yloxy}acetic acid of formula (I):



(I)

and its pharmaceutically acceptable salts.

5,488,152

PROCESS FOR THE PREPARATION OF 4-ALKOXY-3,5,6-TRIFLUORO-PHTHALIC ACIDS AND 3-ALKOXY-2,4,5-TRIFLUOROBENZOIC ACIDS

Ralf Pfirmann, Griesheim, and Theodor Papenfuhs, Frankfurt, both of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

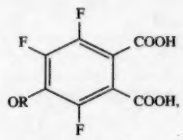
Filed Feb. 9, 1995, Ser. No. 386,292

Claims priority, application Germany, Feb. 12, 1994, 44 04 519.0

Int. Cl.[6] C07C *65/00*

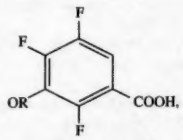
U.S. Cl. 562—474 **30 Claims**

1. A process for the preparation of a 4-alkoxy-3,5,6-trifluorophthalic acid of the formula



(1)

in which R is an alkyl radical having 1 to 5 carbon atoms which may be monofluorinated or polyfluorinated, a cycloalkyl radical having 3 to 5 carbon atoms in the ring which may be monofluorinated or polyfluorinated, or an araliphatic radical which may be monofluorinated or polyfluorinated,



(2)

which comprises reacting tetrafluorophthalic acid or tetrafluorophthalic anhydride with an alcohol of the formula ROH in which R is as defined above and with a water-soluble base in water at elevated temperature, and isolating the 4-alkoxy-3,5,6-trifluorophthalic acid formed.

5,488,153

PROCESS FOR THE CARBONYLATION OF METHANOL OR A REACTIVE DERIVATIVE THEREOF

Michael J. Baker, Twickenham; Jonathan R. Dilworth, Colchester; John G. Sunley, Cottingham, and Nigel Wheatley, Colchester, all of, England, assignors to BP Chemicals Limited, London, England

Filed Jun. 21, 1994, Ser. No. 262,955

Claims priority, application United Kingdom, Jun. 30, 1993, 9313514; Apr. 14, 1994, 9407363

Int. Cl.[6] C07C *51/12;67/36;* **C07F** *15/00;* **B01J** *31/00*

U.S. Cl. 562—519 **15 Claims**

1. A process for the liquid phase carbonylation of methanol or a reactive derivative thereof which process comprises contacting carbon monoxide with a liquid reaction composition comprising methanol or a reactive derivative thereof, a halogen promoter and a rhodium catalyst system comprising a rhodium component and a bidentate phosphorus-sulphur ligand, the ligand comprising a phosphorus dative center linked to a sulphur dative or anionic center by a substantially unreactive backbone structure comprising two connecting carbon atoms or a connecting carbon and a connecting phosphorus atom.

11. A process for the production of acetic acid which process comprises contacting carbon monoxide with a liquid reaction composition comprising methanol or a reactive derivative thereof, a halogen promoter and a rhodium component and a bidentate phosphorus-sulphur ligand, the ligand comprising a phosphorus dative center linked to a sulphur dative or anionic center by a substantially unreactive backbone structure comprising two connecting carbon atoms or a connecting carbon and a connecting phosphorus atom.

5,488,154

PROCESS FOR THE PREPARATION OF ALKOXYALKANOIC ACIDS

Herbert E. Fried, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

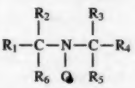
Filed Oct. 13, 1994, Ser. No. 322,642

Int. Cl.[6] C07C *51/27*

U.S. Cl. 562—540 **19 Claims**

1. A process for the preparation of an alkoxyalkanoic acid of the formula $RO(CH_2CHR'O)_nCH_2CO_2H$ wherein R is an alkyl group

of from about 1 to about 1000 carbon atoms, R' is hydrogen or alkyl or mixtures thereof (on the individual molecule) and n is an integer of from about 1 to about 1000, which comprises reacting the corresponding alkoxyalkanol with a stable free radical nitroxide having the formula:



wherein (1) (a) each of R_1, R_2, R_3 and R_4 is an alkyl, aryl or substituted alkyl group having 1 to about 15 carbon atoms, and (b) R_5 and R_6 (i) each is an alkyl group having 1 to about 15 carbon atoms provided that R_1–R_6 are not all alkyl groups, or a substituted alkyl group having 1 to about 15 carbon atoms wherein the substituent is hydrogen, cyano, —$CONH_2$, —$OCOCH_3$, $OCOC_2H_5$, carbonyl, alkenyl wherein the double bond is not conjugated with the nitroxide moiety, or —COOR wherein R of the —COOR group is alkyl or aryl, or (ii) together form part of a ring that contains at least 3 carbon atoms and up to two heteroatoms of O or N, (2) the

moiety and the

moiety individually are aryl, or (3) the

moiety and the

moiety together form a bicyclic ring with the proviso that the group directly adjacent to the N—O moiety is a bridgehead C—H, or a fully alkylated carbon, in the presence of a chromium (II) salt, a nitrite compound, a highly polar solvent, an oxidant and water, at a temperature in the range of from about 0° C. to about 100° C. and thereafter separating out the alkoxyalkanoic acid.

5,488,155

PREPARATION OF L-ASPARTIC ACID

Daniel Brun, Charly; Pierre-Yves Lahary, Lyons, and Jean-Francois Thierry, Francheville, all of, France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Continuation of Ser. No. 120,751, Sep. 15, 1993, abandoned. This application Jun. 1, 1995, Ser. No. 456,375

Claims priority, application France, Sep. 15, 1992, 92 10954

Int. Cl.[6] C07C *227/00*

U.S. Cl. 562—554 **8 Claims**

1. A process for the preparation of L-aspartic acid, comprising treating ammonium aspartate with an effective,, aspartic acid-precipitating amount of fumaric acid in a heterogeneous reaction medium having solid fumaric acid present in the reaction medium at the outset of the treatment and at a temperature up to 100° C.

5,488,156

PREPARATION OF A HEAT-STABLE LACTIC ACID

Santi Kulprathipanja, Inverness; Gregory F. Maher, Aurora, and Thomas W. Lorsbach, La Grange, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed Dec. 23, 1994, Ser. No. 363,662

Int. Cl.[6] C07C *51/42*

U.S. Cl. 562—580 **12 Claims**

1. A process for obtaining heat stable lactic acid from a lactic acid-producing fermentation broth comprising:

a. filtering and ion-exchanging said fermentation broth;

b. heating said filtered, ion-exchanged fermentation broth at a pH less than 3 or greater than 8.5 to a temperature between about 180° and 230° C. for a time sufficient to carbonize any dissolved carbohydrates to afford a heat-treated broth;

c. filtering the heat-treated broth and subjecting the filtrate therefrom to ion-exchange and decolorization to afford an aqueous solution of heat-stable lactic acid; and

d. isolating the heat-stable lactic acid from said aqueous solution.

5,488,157

β-AMINOALKYL AND β-N-PEPTIDYLAMINOALKYL BORONIC ACIDS

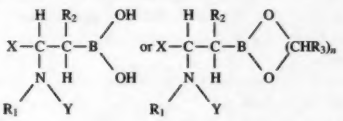
David W. Bjorkquist, Wyoming, and Rajan K. Panandiker, West Chester, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 931,809, Aug. 14, 1992, Pat. No. 5,442,100. This application May 4, 1995, Ser. No. 434,901

Int. Cl.[6] C07F *5/02*

U.S. Cl. 562—7 **10 Claims**

1. A composition which has serine protease reversible inhibition properties and which is useful for incorporation into enzyme-containing liquid detergent products, which composition comprises a serine protease and an effective amount of a protease inhibitor compound having the formula:



where R_1, R_2, and R_3 are independently hydrogen or C_1–C_4 alkyl; n is 2–4; X is phenyl or C_1–C_6 alkyl; and Y is selected from the group consisting of

(a) hydrogen;

(b) an amine protecting group selected from the group consisting of

i) t-butoxycarbonyl,

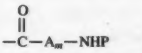
ii) methoxycarbonyl,

iii) benzyloxycarbonyl, and

wherein R_5 is phenyl or C_1–C_4 alkyl; and

iv)

(c)



wherein A is independently selected from naturally occurring amino acids; m is 1 to 3; and P is selected from the protecting groups of Component (b).

5,488,158

PRODUCTION IN CONTINUOUS OF OXAMIDE FOR THE CATALYTIC OXIDATION OF HCN

Giuseppe Messina, Alghero; Giovanni M. Sechi, Ozieri, and Silvio De Micheli, Milanese, all of, Italy, assignors to Enichem S.p.A., Milan, Italy

Continuation of Ser. No. 62,535, May 18, 1993, abandoned. This application Feb. 10, 1995, Ser. No. 386,599

Claims priority, application Italy, May 22, 1992, MI92A0248

Int. Cl.[6] C07C *231/00*

U.S. Cl. 564—125 **12 Claims**

1. A continuous process for the preparation of oxamide, by the oxidation of HCN with oxygen or air in the presence of an acid aqueous solution of copper nitrate, $Cu(NO_3)_2$, according to the following reaction:

$$2HCN+\tfrac{1}{2}O_2+H_2O \rightarrow H_2N—OC—CO—NH_2,$$

comprising:

(i) feeding continuously into a vertical tubular reactor, said vertical tubular reactor having a bottom and a head:

(a) an aqueous catalyst solution comprising acetic acid, nitric acid and copper nitrate $Cu(NO_3)_2$,

(b) hydrogen cyanide, HCN; and

(c) oxygen or air, to obtain a suspension comprising oxamide;

(ii) continuously removing the suspension of oxamide from the bottom of the tubular reactor and the quantity of oxygen in excess of the stoichiometric quantity from the head of the reactor together with any other gases produced in secondary reactions,

(iii) continuously separating said oxamide from a part of the suspension removed from the bottom of the reactor; and

(iv) recycling the catalyst solution, comprising copper nitrate, acetic acid and nitric acid, after adding the stoichiometric quantity of water consumed in the synthesis reaction, wherein:

(a) said suspension of oxamide is continuously removed from the lowest point of the reactor;

(b) a quantity of the suspension of oxamide removed from the lowest point of the reactor is recycled, re-introducing it into the highest part of the reactor, after cooling it in a heat exchanger at a temperature which is sufficient to maintain the established reaction temperature inside the reactor;

(c) an amount of the suspension of oxamide continuously removed from the lowest point of the reactor is not recycled but is rapidly treated in a battery with two cyclones placed in series, to separate the oxamide from the majority of the acid catalyst solution;

(d) oxygen or air in an excess of 40 to 60% of the stoichiometric quantity is fed to the base of the reactor,

(e) HCN under pressure and in a liquid phase is fed into the highest part of the tubular reactor, at a height which is never less than ⅘ of the height of the aerated liquid inside the column and never more than ⅘ of the same height; and

(f) the aqueous catalytic solution, before being charged into the reactor, is added to the recycled suspension of oxamide, and is then introduced with the same suspension into the upper part of the tubular reactor, and at a height which is never lower than that at which said HCN is introduced.

5,488,159

PROCESS FOR PRODUCING METHOXYIMINOACETAMIDE COMPOUNDS AND INTERMEDIATES

Akira Takase, Otsu; Hiroyuki Kai, Koriyama; Kuniyoshi Nishida, Koga; Shoji Shinomoto, Matsubara, and Masahiko Nagai, Amagasaki, all of, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

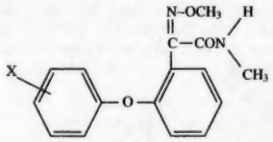
Division of Ser. No. 120,392, Sep. 14, 1993, Pat. No. 5,380,913, which is a continuation-in-part of Ser. No. 964,042, Oct. 21, 1992, abandoned, which is a division of Ser. No. 733,303, Jul. 22, 1991, Pat. No. 5,183,921. This application Aug. 25, 1994, Ser. No. 295,458

Claims priority, application Japan, Jul. 26, 1990, 2-200696

Int. Cl.[6] C07C *239/20*

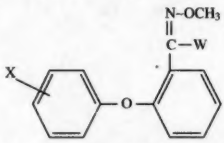
U.S. Cl. 564—164 **7 Claims**

1. A process for producing a compound of the formula [I]



[I]

wherein X is hydrogen, lower alkyl, lower alkoxy or halogen; and ~ is any configuration of E-isomer, Z-isomer or a mixture thereof, which comprises reacting a compound of the formula [II]:



[II]

wherein X and ~ are as defined above with methylamine in the presence of methanol.

5,488,160

AMIDINO COMPOUNDS, THEIR MANUFACTURE AND METHOD OF TREATMENT

Michael M. Morrissey, Danville, Calif., assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

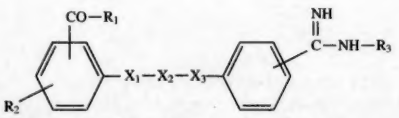
Continuation-in-part of Ser. No. 978,004, Nov. 18, 1992, which is a continuation-in-part of Ser. No. 960,211, Oct. 13, 1992, abandoned, which is a continuation of Ser. No. 714,108, Jun. 11, 1991, abandoned. This application Dec. 9, 1993, Ser. No. 164,176

The portion of the term of this patent subsequent to Sep. 19, 2012, has been disclaimed.

Int. Cl.[6] C07C *233/65;235/44;237/30;* **A61K** *31/165*

U.S. Cl. 564—165 **16 Claims**

1. A compound of the formula



(I)

wherein the C(=NH)—NHR_3 group may be in tautomeric or isomeric form,

R_1 is amino which is mono- or disubstituted by a substituent selected from an aliphatic hydrocarbon radical, an araliphatic hydrocarbon radical, an aromatic radical, and a cycloaliphatic hydrocarbon radical, or is amino which is disubstituted by a divalent aliphatic hydrocarbon radical or a said radical interrupted by oxygen;

R_2 is hydrogen, halogen, trifluoromethyl, an aliphatic hydrocarbon radical, or is hydroxy which is etherified by an

aliphatic alcohol, araliphatic alcohol, or aromatic alcohol or which is esterified by an aliphatic or araliphatic carboxylic acid; or R_2 is hydroxy;

R_3 is hydrogen or an acyl radical which is derived from an organic carbonic acid, an organic carboxylic acid, a sulfonic acid, or a carbamic acid;

X_1 and X_3, independently of one another, are oxygen (—O—) or sulphur (—S—); and

X_2 is a divalent aliphatic hydrocarbon radical which may be interrupted by an aromatic radical;

wherein the phenyl rings of formula I may be, independently of one another, further substituted by one or more substituents selected from halogen, trifluoromethyl, an aliphatic hydrocarbon radical, hydroxy, and hydroxy which is etherified by an aliphatic alcohol or which is esterified by an aliphatic or araliphatic carboxylic acid;

wherein aryl in the above definitions may be, independently of one another, further substituted by one or more substituents selected from halogen, trifluoromethyl, an aliphatic hydrocarbon radical, hydroxy, and hydroxy which is etherified by an aliphatic alcohol or which is esterified by an aliphatic or araliphatic carboxylic acid;

wherein a cycloaliphatic hydrocarbon radical may be substituted by an aliphatic radical; or a pharmaceutically acceptable salt thereof.

5,488,161

OXIMATION PROCESS

Leroy O. Krbechek, Santa Rosa, Calif., assignor to Henkel Corporation, Plymouth Meeting, Pa.

Continuation-in-part of Ser. No. 854,522, Mar. 20, 1992, Pat. No. 5,300,689, and a continuation-in-part of Ser. No. 87,828, Jul. 7, 1993, Pat. No. 5,349,088. This application Mar. 30, 1994, Ser. No. 220,130

The portion of the term of this patent subsequent to Sep. 20, 2011, has been disclaimed.

Int. Cl.[6] C07C *249/08*

U.S. Cl. 564—259 **21 Claims**

1. In a method of preparing aromatic oximes by reaction of a aromatic ketone or aldehyde carbonyl compound with hydroxylamine the improvement which comprises conducting the reaction in the presence of a catalytic amount of a phase transfer catalyst compound comprising a mixture of an alkyl phenol and an organic carboxylic acid, and an alkali metal or alkaline earth metal hydroxide, carbonate or bicarbonate, the catalyst mixture being present in an amount effective to act as a phase transfer catalyst.

5,488,162

PROCESS FOR PREPARING O-ALKYLHYDROXYLAMINE SALTS WITHOUT THE ISOLATION OF INTERMEDIATES

Paul R. Buckland, 1 Lawton Dr., Rochester, N.Y. 14534

Filed Jan. 3, 1994, Ser. No. 176,985

Int. Cl.[6] C07C *209/00*

U.S. Cl. 564—301 **2 Claims**

2. A process for preparing O-alkylhydroxylamines without isolation of intermediates, said process comprising the following steps:

(I) neutralizing an aqueous solution of a hydroxylamine salt to produce hydroxylamine;

(II) reacting an aliphatic ketone having 3 to 10 carbon atoms with hydroxylamine formed in Step (I) to produce a two phase system comprising an upper layer of ketoxime and a lower layer of inorganic salt solution;

(III) adding an alkylating agent to the ketoxime formed in Step (II) to form a alkylating agent/ketoxime mixture;

(IV) removing the inorganic salt solution;

(V) adding the alkylating agent/ketoxime mixture to a suspension of an alkali metal hydride in a water miscible amide solvent to form an O-alkylketoxime;

(VI) adding water and an alkane solvent to the O-alkylketoxime formed in Step (V) to give a two phase mixture comprising an upper layer of the O-alkylketoxime in the alkane solvent and a lower aqueous layer containing the amide solvent;

(VII) removing the aqueous solution;

(VIII) adding a concentrated mineral acid to the alkane solution formed in Step (VI) to give a two phase mixture comprising a lower layer of the O-alkylketoxime in mineral acid and an upper layer of the alkane solvent solution;

(IX) removing the alkane solution;

(X) heating the mineral acid solution of O-alkylketoxime formed in Step (VIII) and removing by distillation the ketone formed, to give an aqueous solution of O-alkylhydroxylamine.

5,488,163

PROCESS FOR THE PRODUCTION OF 4, 4'-(PHENYLENE-DIISOPROPYL)-BIS(2, 6-DIALKYLANILINES)

Peter Hardt, Visp; Ulrich Daum, Hofstetten, and Theodor Völker, Marly, all of, Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

Division of Ser. No. 137,972, Oct. 19, 1993, abandoned. This application Dec. 20, 1994, Ser. No. 360,082

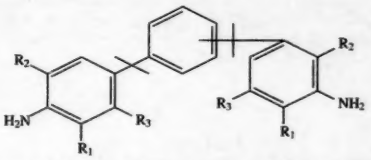
Claims priority, application Switzerland, Jan. 21, 1992, 3264/92

Int. Cl.[6] C07C *209/68*

U.S. Cl. 564—315 **4 Claims**

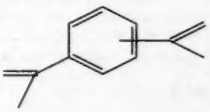
1. Process for the production of 4,4'-(phenylenediisopropyl)bis(2,6-dialkylanilines) of formula:

I



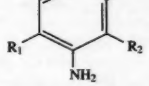
wherein R_1 and R_2 are the same or different and each is a (C_1–C_4)-alkyl group, R_3 is a hydrogen or halogen atom, and the central phenylene function is substituted in the 1,3 or 1,4 position, comprising reacting a diisopropenyl benzene of formula:

II



wherein the isopropenyl groups on the aromatic nucleus are in the 1,4 or 1,3 position to one another, in the presence of aluminum chloride as a catalyst is reacted with an aniline of formula:

III



wherein R_1, R_2 and R_3 have the above-mentioned meanings, the reaction is carried out with exclusion of water at a temperature between 120° and 200° C., the aluminum chloride is used in an amount of 0.02 to 0.3 mol, relative to 1 mol of the aniline of formula III, and the diisopropenyl benzene of formula II, relative to the aniline of formula III, is used in an excess of 10 to 100 percent.

5,488,164

ELECTROPHOTOGRAPHIC PHOTOCONDUCTORS AND TERTIARY AMINE COMPOUNDS HAVING CONDENSED POLYCYCLIC GROUP FOR USE IN THE SAME

Tomoyuki Shimada, Numazu; Masaomi Sasaki, Susono, and Tamotsu Aruga, Mishima, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 15,339, Feb. 9, 1993, Pat. No. 5,382,692, which is a division of Ser. No. 490,468, Mar. 8, 1990, Pat. No. 5,219,692. This application Aug. 15, 1994, Ser. No. 290,094

Claims priority, application Japan, Mar. 29, 1989, 1-077839; Jun. 14, 1989, 1-151605; Jul. 25, 1989, 1-191640

Int. Cl.[6] C07C *211/54*; G03G *5/14*

U.S. Cl. 564—426 **17 Claims**

1. A charge transporting material comprising a tertiary amine compound having a condensed polycyclic hydrocarbon group of formula (I):

(I)

wherein A^1 or A^2 is a linear or branched alkyl group having 1 to 12 carbon atoms, which may have a substituent and Ar represents an unsubstituted or substituted condensed polycyclic hydrocarbon group selected from the group consisting of a pentalenyl group, an indenyl group, an azulenyl group, a heptalenyl group, a biphenylenyl group, an as-indacenyl group, an s-indacenyl group, an acenaphthenyl group, a pleiadenyl group, an acenaphthenyl group, a phenalenyl group, a phenanthryl group, a 1-anthryl group, a 2-anthryl group, a 2-naphthyl group, a fluoranthenyl group, an acephenanthrylenyl group, an aceanthrylenyl group, a triphenylenyl group, a chrysenyl group and a naphthacenyl group wherein said substituent on Ar is selected from the group consisting of halogen, a cyano group, a nitro group, a linear or branched C_{1-12} alkyl group which may have a substituent selected from a fluorine group, a hydroxyl group, a cyano group, a C_{1-4} alkoxy or a phenyl group which may be substituted by halogen, a C_{1-14} alkyl group or a C_{1-4} alkoxy group.

5,488,165

PROCESS FOR THE PRODUCTION OF METHYL AMINES

Graham J. Hutchin, Osmotherley, England; Themistoclis Themistocleous, Bryanston, and Richard G. Copperthwaite, Johannesburg, both of, South Africa, assignors to Zeofuels Research (Proprietary) Limited, Transvaal, South Africa

Division of Ser. No. 683,412, Apr. 10, 1991, abandoned. This application Dec. 30, 1991, Ser. No. 815,626

Claims priority, application South Africa, Apr. 10, 1990, 90/2721

Int. Cl.[6] C07C *209/16*

U.S. Cl. 564—479 **6 Claims**

1. A process for the conversion of methanol and ammonia to give a product containing at least 70% by weight of monomethylamine in a reactor in the presence of a modified natural clinoptilolite catalyst produced by treating a natural clinoptilolite with either (1) a mineral acid at a concentration of greater than 1M for a treatment time of longer than 24 hours and at a treatment temperature of from 40° C. to 80° C. inclusive; or (2) an alkali at a concentration greater than 0.5M for a treatment time of longer than 1 hour at a treatment temperature of from 30° C. to 80° C. inclusive, washing the resulting product, and treating the resulting product with a mineral acid at a concentration of greater than 0.1M for a treatment time of longer than 1 hour and at a treatment temperature of from 40° C. to 80° C. inclusive which includes the steps of:

(a) feeding the methanol and ammonia to the reactor containing the catalyst;

(b) converting the methanol and the ammonia in the reactor in the presence of the catalyst at a temperature of from 300° C. to 500° C. inclusive, and at a pressure of from 1 to 20 atmospheres inclusive; and

(c) recovering the product.

5,488,166

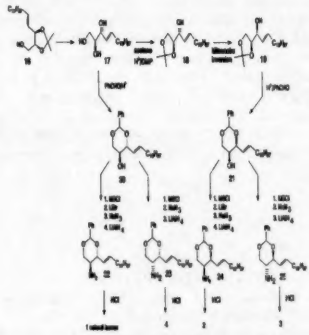
SYNTHESIS OF SPHINGOSINES

Tomas Hudlicky, Blacksburg, Va., assignor to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.

Division of Ser. No. 137,346, Oct. 18, 1993, abandoned. This application Jan. 23, 1995, Ser. No. 377,095

Int. Cl.[6] C07C *209/42*

U.S. Cl. 564—487 **4 Claims**



1. A method for the synthesis of D-erythro-sphingosine comprising:

a. treating (+)-cis-2,3-dihydroxy-1-chlorocyclohexa- 4,6-diene with p-toluenesulfonic acid in the presence of 2,2-dimethoxypropane to form (2R,3S)-2,3-O-isopropylidene-1-chlorocyclohexa-4,6-diene;

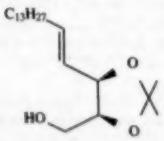
b. subjecting said (2R,3S)-2,3-O-isopropylidene-1-chlorocyclohexa-4,6-diene to ozonolysis followed by cyclization of the product of said ozonolysis to form 2,3-O-isopropylidene-D-erythruronolactone;

c. reducing said 2,3-O-isopropylidene-D-erythruronolactone in the presence of sodium borohydride to produce sodium (S,S)-2,3-O-isopropylidene-4-hydroxybutanoate;

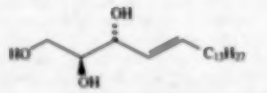
d. cyclizing said sodium (S,S)-2,3-O-isoproplidene-4-hydroxybutanoate in the presence of iodomethane to form 2,3-O-isopropylidene-L-erythrono-1,4-lactone;

e. treating said 2,3-O-isopropylidene-L-erythrono-1,4-lactone with DIBAL solution to form 2,3-O-isopropylidene-L-erythrose;

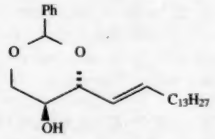
f. subjecting said 2,3-O-isopropylidene-L-erythrose to Wittig olefination to obtain a product with the following formula:



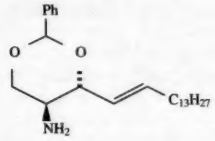
g. subjecting the product of step f to catalytic deprotection with H^+ to obtain a product with the following formula:



h. reacting the product of step g with benzaldehyde in the presence of H^+ to obtain a product with the following formula:



i. reacting the product of step h with methanesulfonyl chloride, lithium bromide, sodium azide and lithium aluminum hydride in a four step sequential reaction to obtain a product with the following formula:



j. reacting the product of step i with hydrogen chloride to obtain D-erythro-sphingosine.

5,488,167

SYNTHESIS OF SPHINGOSINES

Tomas Hudlicky, Blacksburg, Va., assignor to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.

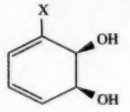
Continuation of Ser. No. 137,346, Oct. 18, 1993, abandoned. This application Feb. 21, 1995, Ser. No. 389,622

Int. Cl.[6] C07C *209/42*

U.S. Cl. 564—489 **14 Claims**

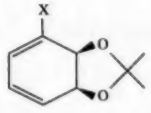
1. A process for the synthesis of a stereospecific sphingosine comprising

a. providing an arene diol of the formula:

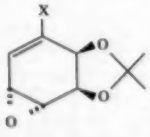


wherein X is H, halogen, OH, OR, phenyl, acetylene, NH_2, N_3, NR_2, NRH, NO_2, CO_2H, or CN and R is lower alkyl or lower alkenyl;

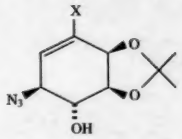
b. protecting the diol as its acetonide with the following formula:



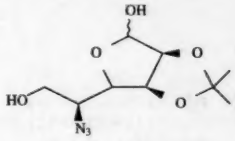
c. converting the acetonide to an epoxide having the formula:



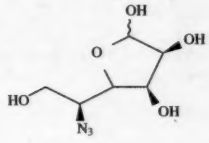
d. reacting the epoxide with an effective amount of an azide salt to stereospecifically open the epoxide and obtain an azido alcohol with the formula:



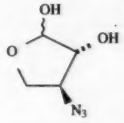
e. reacting the azido alcohol with excess ozone and then with excess borohydride to give a first lactol with the formula:



f. reacting the first lactol with an acidic ion exchange resin to deprotect the first lactol and obtain a second lactol of the formula:



g. reacting the second lactol with an effective amount of an alkali periodate to obtain a third lactol with the formula:



h. subjecting the third lactol to Wittig olefination to give azidosphingosine; and

i. reducing the azidosphingosine to an amine to obtain the desired sphingosine.

5,488,168

TERTIARY AMINO ALCOHOL AND METHOD OF PRODUCING THE SAME

Kohshiro Sotoya; Hiroshi Abe; Jun Aikawa; Hideki Taniguchi, and Uichiro Nishimoto, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 563,712, Aug. 7, 1990, abandoned. This application Apr. 14, 1993, Ser. No. 46,924

Claims priority, application Japan, Aug. 25, 1989, 1-219046

Int. Cl.[6] C07C *215/08*

U.S. Cl. 564—506 **2 Claims**

1. A tertiary amino alcohol of the formula

wherein R is a C_6–C_8 alkylene chain; R^1 is methyl, and n is from 2.7 to 18.2.

5,488,169

METHOD OF PRODUCING TETRAKIS(PENTAFLUOROPHENYL)BORATE DERIVATIVES USING PENTAFLUOROPHENYLMAGNESIUM DERIVATIVES

Yoshihiko Ikeda, Shimamoto; Takeo Yamane, Ogori; Eiichi Kaji, and Kenji Ishimaru, both of Shimamoto, all of, Japan, assignors to Tosoh Akzo Corporation, Tokyo, Japan

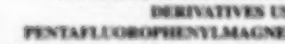
Filed Dec. 21, 1993, Ser. No. 170,762

Claims priority, application Japan, Dec. 28, 1992, 4-361480; Dec. 1, 1993, 5-329960

Int. Cl.[6] C07F 5/02; 9/02

U.S. Cl. 568—3 **2 Claims**

1. A process for producing a tetrakis(pentafluorophenyl)borate compound of the formula V

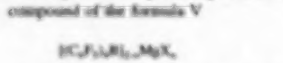


V

comprising; mixing in a mixture of diethylether and other chain ether solvent having a boiling point of 50° C. or higher, or in a mixture of diethylether and a hydrocarbon solvent having a boiling point of 50° C. or higher, one equivalent weight of a boron compound of the formula I

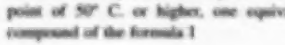
I

wherein X denotes a moiety selected from the group consisting of a halogen atom, a substituent represented by the formula II



II

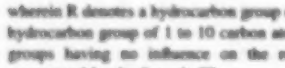
wherein R denotes a hydrocarbon group of 1 to 10 carbon atoms, a hydrocarbon group of 1 to 10 carbon atoms containing functional groups having no influence on the reaction, or a substituent represented by the formula III



III

wherein R' and R" are the same or different and may be a hydrogen atom, a hydrocarbon group of 1 to 20 hydrocarbons or a hydrocarbon group of 1 to 20 hydrocarbons having a functional group having no influence on the reaction, or R' and R" are linked to one another to form a ring structure, said boron compound being either in the form of a 1:1 complex with an ether type solvent or in non-complexed form;

with 3.7 equivalents or more of a pentafluorophenylmagnesium compound of the formula IV



IV

wherein n denotes an integer of 0 or 1 and X denotes a halogen atom; and reacting said mixture at a temperature in the range of 69° to 200° C.

5,488,170

PROCESS FOR PRODUCING 3-METHYL-1-PHENYLPHOSPHOLENE OXIDE

Yasuo Imashiro; Naofumi Horie, and Takeshi Yamane, all of Tokyo, Japan, assignors to Nisshinbo Industries, Inc., Tokyo, Japan

Filed Jun. 28, 1994, Ser. No. 266,552

Claims priority, application Japan, Jul. 2, 1993, 5-190831

Int. Cl.[6] C07F 9/53

U.S. Cl. 568—12 **4 Claims**

1. A process for producing 3-methyl-1-phenylphospholene oxide by subjecting dichlorophenylphosphine and isoprene to an addition reaction and then subjecting the resulting adduct to hydrolysis or alcoholysis, wherein the addition reaction between dichlorophenylphosphine and isoprene is conducted in a solvent containing no active hydrogen to obtain an adduct in the form of a slurry or solution and the slurry or solution is subjected to hydrolysis or alcoholysis, wherein isoprene is used in an amount of at least 1 mole per mole of dichlorophenylphosphine, wherein the solvent is used in an amount of 200–400 ml per mole of dichlorophenylphosphine and the addition reaction is performed at 65°–70° C. for 24 hours or less when conducted in a heterogeneous system and the solvent is used in an amount of 100–200 ml per mole of dichlorophenylphosphine and the addition reaction is performed at 65°–80° C. for 24 hours or less when conducted in a homogeneous system, and wherein said solvent is at least one member selected from the group consisting of an aromatic hydrocarbon, an aliphatic hydrocarbon, a halogen-containing hydrocarbon and a nitrogen-containing hydrocarbon.

5,488,171

PHOSPHINATE ESTERS

Eric K. Baylis, Stockport, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

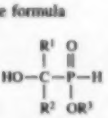
Filed Feb. 28, 1994, Ser. No. 203,961

Claims priority, application United Kingdom, Mar. 6, 1993, 9304619

Int. Cl.[6] C07F 9/02

U.S. Cl. 568—8 **17 Claims**

1. A compound of the formula



I

where R^1 and R^2 are independently a C_1–C_{10} aliphatic radical, or R^1 is C_1–C_{10} alkyl or halogen-substituted C_1–C_{10} alkyl and R^2 is a C_6–C_{10} aromatic radical, and R^3 is a C_1–C_8 aliphatic radical, a C_3–C_8 cycloaliphatic radical, a C_6–C_{15} aromatic radical or a C_7–C_{13} araliphatic radical, provided that R^3 is not methyl when R^1 and R^2 are each methyl, that R^3 is not ethyl when R^1 and R^2 are each methyl, and that R^2 is not p-aminophenyl when R^1 is methyl and R^3 is ethyl.

5,488,172

CHIRAL PHOSPHORUS COMPOUNDS

Marco Cereghetti, Basel, Switzerland; Joseph Foricher, Mulhouse, France; Bernd Heiser, Inzlingen, Germany, and Rudolf Schmid, Münchenstein, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

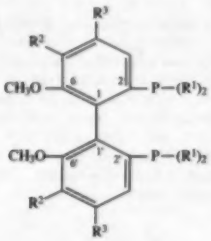
Continuation of Ser. No. 152,932, Nov. 15, 1993, abandoned, which is a continuation of Ser. No. 884,628, May 15, 1992, abandoned, which is a continuation of Ser. No. 521,498, May 10, 1990, abandoned. This application Aug. 23, 1994, Ser. No. 294,895

Claims priority, application Switzerland, May 18, 1989, 1905/89; Mar. 16, 1990, 880/90

Int. Cl.[6] C07F *9/50*

U.S. Cl. 568—13 15 Claims

1. A chiral phosphorous compound of the formula:



wherein R^1 is phenyl or lower alkyl-substituted phenyl, and R^2 and R^3 are hydrogen or methoxy;
which compound are in the (R)- or (S)-form.

5,488,173

PROCESS FOR SELECTIVE ORTHO-METHYLATION OF CYCLOHEXANONES IN THE VAPOR PHASE

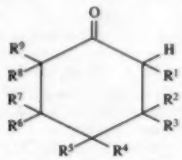
Fey-Long Wang, Department of Applied Chemistry, Providence University, Sha-Lu, Taichung Hsien, 43301, Taiwan, Prov. of China

Filed Aug. 3, 1994, Ser. No. 285,152

Int. Cl.[6] C07C *45/68*

U.S. Cl. 568—347 12 Claims

1. A process for selectively methylating a cyclohexanone in the ortho-position to produce orthomethylated cyclohexanones and ortho-methylated phenols, which comprises reacting methanol with the cyclohexanone in the vapor phase in the presence of a metal oxide catalyst,
wherein the cyclohexanone has the general formula



wherein R^1, is one member selected from the group consisting of hydrogen and methyl, wherein R^2, R^3, R^4, R^5, R^6, R^7, R^8, and R^9 each are hydrogen and wherein the metal oxide catalyst is at least one member selected from the group consisting of titanium oxide, alumina, zirconium oxide, silicon oxide, magnesium oxide, zinc oxide, lead oxide, and iron oxide.

5,488,174

HYDROFORMYLATION PROCESS

Eit Drent; Dennis H. L. Pello, and Jacoba C. L. J. Suykerbuyk, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 12, 1994, Ser. No. 289,714

Claims priority, application European Pat. Off., Aug. 19, 1993, 93202447

Int. Cl.[6] C07C *45/50*

U.S. Cl. 568—454 24 Claims

1. A process for the hydroformylation of ethylenically unsaturated compounds to produce aldehydes and/or alcohols by reaction of said ethylenically unsaturated compounds with carbon monoxide and hydrogen in the presence of a catalyst system comprising:
a) a source of a metal of the platinum group;
b) a source of anions; and
c) a source of bidentate ligands of the formula

$$R^1R^2M^1RM^2R^3R^4 \quad (I)$$

wherein M^1 and M^2 independently represent a phosphorus, arsenic or antimony atom, R represents a bivalent organic bridging group containing from 1 to 4 atoms in the bridge, R^1 and R^2 together represent a bivalent substituted or non-substituted cyclic group wherein the two free valencies are linked to M^1, and wherein R^3 and R^4 either independently represent a substituted or non-substituted hydrocarbyl group, or together have the same meaning as R^1 and R^2.

5,488,175

HYDROFORMYLATION PROCESS

Eit Drent, and Willem W. Jager, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

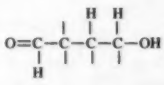
Filed Sep. 12, 1994, Ser. No. 304,716

Claims priority, application European Pat. Off., Sep. 16, 1993, 93202688

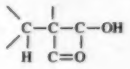
Int. Cl.[6] C07C *45/50*

U.S. Cl. 568—454.000 21 Claims

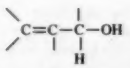
1. A process for the hydroformylation of unsaturated compounds to produce compounds containing a group



and compounds containing a group



which comprises contacting and reacting a compound containing a group



with carbon monoxide and hydrogen in the presence of a catalyst system comprising:

a) a source of rhodium and

b) a ligand of the formula

$$R^1R^2P—R—NR^3R^4 \quad (I)$$

wherein each of R^1, R^2, R^3, and R^4 independently represents a substituted or unsubstituted hydrocarbyl group and R represents a bivalent organic bridging group containing from 1 to 5 atoms in the bridge.

5,488,176

PREPARATION OF DIALKYL PEROXIDES

Mahmoud K. Faraj, Newtown Square, Pa., assignor to Arco Chemical Technology, Greenville, Del.

Continuation-in-part of Ser. No. 61,408, May 13, 1993, abandoned. This application Jan. 13, 1995, Ser. No. 373,671

Int. Cl.[6] C07C *409/16*

U.S. Cl. 568—558.000 **7 Claims**

1. A process for the selective preparation of a dialkyl peroxide which comprises reacting an alcohol and/or olefin with hydrogen peroxide at 70°–120° C. in the presence of an effective amount of an inorganic heteropoly or isopoly acid catalyst, the mol ratio of alcohol and/or olefin to hydrogen peroxide being at least 1, the catalyst being employed in amount of at least 1 mol catalyst per 250 mols of alcohol and/or olefin.

5,488,177

METHOD FOR THE PREPARATION OF ALKYL HYDROPEROXIDE SOLUTIONS CONTAINING LITTLE OR NO WATER

Hans Appel, Hollriegelskreuth, and Fritz Diem, Munich, both of, Germany, assignors to Peroxid-Chemie GmbH, Hollriegelskreuth, Germany

PCT No. PCT/EP93/02620, § 371 Date Nov. 1, 1994, § 102(e) Date Nov. 1, 1994, PCT Pub. No. WO94/07854, PCT Pub. Date Apr. 14, 1994

PCT Filed Sep. 27, 1993, Ser. No. 331,593

Claims priority, application Germany, Sep. 28, 1992, 42 32 500.5

Int. Cl.[6] C07C *409/00*

U.S. Cl. 568—576 **23 Claims**

1. Method for the preparation of solutions of tert.-alkyl hydroperoxides in inert solvents with little or no water content by dewatering with H_2SO_4, which comprises adding to an aqueous solution of the tert.-alkyl hydroperoxide, one or more inert organic solvents as well as sulfuric acid in an amount and concentration such that, in the aqueous phase forming after the mixing and subsequent separation of the phases, there is at least 49% of H_2SO_4 and the water content in the organic phase amounts to no more than 2.5%.

5,488,178

DITERTIARY BUTYL PEROXIDE PREPARATION FROM TERTIARY BUTYL HYDROPEROXIDE

John F. Knifton; Edward T. Marquis, both of Austin, and Pei-Shing E. Dai, Port Arthur, all of Tex., assignors to Texaco Chemical Inc., White Plains, N.Y.

Filed Mar. 8, 1995, Ser. No. 401,107

Int. Cl.[6] C07C *409/16*

U.S. Cl. 568—578 **20 Claims**

1. A method for selectively generating ditertiary butyl peroxide which comprises bringing a solution of tertiary butyl hydroperoxide charge stock in tertiary butyl alcohol into contact with a catalytically effective amount of a solid acid catalyst comprising an acidic montmorillonite clay in a reaction zone in a liquid phase under hydroperoxide conversion conditions including a temperature within the range of about 20° C. to 160° C. and a pressure of about atm to 10,000 psig, selectively generating ditertiary butyl peroxide, along with t-butanol, from tertiary butyl hydroperoxide, and recovering said ditertiary butyl peroxide product.

5,488,179

DITERTIARY BUTYL PEROXIDE PREPARATION FROM TERTIARY BUTYL HYDROPEROXIDE

John F. Knifton; Edward T. Marquis, both of Austin, and Pei-Shing E. Dai, Port Arthur, all of Tex., assignors to Texaco Chemical Inc., White Plains, N.Y.

Filed Mar. 8, 1995, Ser. No. 401,108

Int. Cl.[5] C07C *409/16*

U.S. Cl. 568—578 **6 Claims**

1. A method for selectively generating ditertiary butyl peroxide which comprises bringing a solution of tertiary butyl hydroperoxide charge stock in tertiary butyl alcohol into contact with a catalytically effective amount of an acidic Beta zeolite catalyst in a reaction zone in a liquid phase under hydroperoxide conversion conditions including a temperature within the range of about 20° C. to 160° C. and a pressure of about ATM to 10,000 psig selectively generate ditertiary butyl peroxide, along with t-butanol, from tertiary butyl hydroperoxide, and recovering said ditertiary butyl peroxide product.

5,488,180

COMPLEX HYDROPHOBE COMPOUNDS

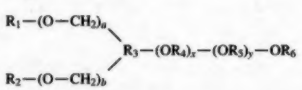
Richard D. Jenkins, Hurricane; David R. Bassett, Charleston; Danny E. Smith, Cross Lanes; John N. Argyropoulos, Scott Depot; James E. Loftus, Hurricane, all of W. Va., and Gregory D. Shay, Cary, N.C., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed May 29, 1992, Ser. No. 887,648

Int. Cl.[6] C07C *43/13;43/205;43/164;43/19*

U.S. Cl. 568—609 **10 Claims**

1. A compound represented by the formula selected from the group consisting of:



wherein R_1 and R_2 are the same or different and are hydrogen or a substituted or unsubstituted monovalent hydrocarbon residue, R_3 is a substituted or unsubstituted divalent or trivalent hydrocarbon residue, each R_4 is the same or different and is a substituted or unsubstituted divalent hydrocarbon residue, each R_5 is the same or different and is a substituted or unsubstituted divalent hydrocarbon residue, R_6 is hydrogen, a substituted or unsubstituted monovalent hydrocarbon residue or an ionic substituent, a and b are the same or different and are a value of 0 or 1, and x and y are the same or different and are a value of 0 or greater; provided (i) at least two of R_1, R_2, R_3, R_4, R_5 and R_6 are a hydrocarbon residue having greater than 2 carbon atoms in the case of R_1, R_2 and R_6 or having greater than 2 pendant carbon atoms in the case of R_3, R_4 and R_5, (ii) at least one of R_4 and R_5 is other than $—CH_2CH_2—$ when R_1 and R_2 are nonylphenyl, R_3 is >CH—, R_6 is hydrogen or SO_3, a is a value of 1, b is a value of 1, and at least one of x and y is a value of I or greater, (iii) R_4 is $—CH_2CH_2—$ and x is a value of at least 2 when R_1 is hexadecyl, R_2 is tetradecyl, R_3 is >CH—, at least one R_5 is $—CH_2CH(tetradecyl)—$, R_6 is hydrogen, y is a value of 1 or greater, a is a value of 1, and b is a value of 0; (iv) at least one of R_1 and R_2 is other than $CH_3(CH_2)_{1-5}OCH_2CH(OH)CH_2—$ when R_6 is $CH_3(CH_2)_{1-5}—$, a is a value of 1, b is a value of 1, y is a value of 0, x is a value of 1, R_4 is $—CH_2CH(OH)CH_2—$ and R_3 is >CH—; (v) R_1 is other than $CH_3(CH_2)_{1-5}OCH_2CH(OH)CH_2—$

when a is a value of 1, b is a value of 0 and R_6 is $CH_3(CH_2)_{1-5}$—; (vi) at least one of R_1 and R_2 is other than $CH_3(CH_2)_{1-5}OCH_2CH(OH)CH_2$— when R_6 is $CH_3(CH_2)_3CH_2CH(OH)CH_2$—, a is a value of 1, b is a value of 1, x is a value of 0, y is a value of 0 and R_3 is >CH—; and (vii) at least one of R_4 and R_5 is other than —CH_2CH_2— when R_1 and R_2 are the same and are an aromatic hydrocarbon residue, R_3 is >CH—, R_6 is hydrogen, a is a value of 1, b is a value of 1 and at least one of x and y is a value of 1 or greater; and

$$R_7-(OCH_2)_d-R_9-(OR_{10})_f-OR_{11}$$
$$\qquad\qquad\quad |$$
$$\qquad\qquad R_{15}$$
$$\qquad\qquad\quad |$$
$$R_8-(OCH_2)_e-R_{12}-(OR_{13})_g-OR_{14}$$

wherein R_7 and R_8 are the same or different and are hydrogen or a substituted or unsubstituted monovalent hydrocarbon residue, R_9 and R_{12} are the same or different and are a substituted or unsubstituted divalent or trivalent hydrocarbon residue, each R_{10} is the same or different and is a substituted or unsubstituted divalent hydrocarbon residue, each R_{13} is the same or different and is a substituted or unsubstituted divalent hydrocarbon residue, R_{11} and R_{14} are the same or different and are hydrogen, a substituted or unsubstituted monovalent hydrocarbon residue or an ionic substituent, R_{15} is a substituted or unsubstituted divalent hydrocarbon residue, d and e are the same or different and are a value of 0 or 1, and f and g are the same or different and are a value of 0 or greater; provided at least two of R_7, R_8, R_9, R_{10}, R_{11}, R_{12}, R_{13}, R_{14} and R_{15} are a hydrocarbon residue having greater than 2 carbon atoms in the case of R_7, R_8, R_{11} an R_{14} or having greater than 2 pendant carbon atoms in the case of R_9, R_{10}, R_{12}, R_{13} and R_{15}.

5,488,181

PROCESS FOR PREPARING PERFLUOROPOLYETHERS

Giuseppe Marchionni, Milan; Pier A. Guarda, Nole, and Maurizio Paganin, Cassina de'Pecchi, all of, Italy, assignors to Ausimont S.p.A., Milan, Italy

Filed Nov. 16, 1994, Ser. No. 341,150

Claims priority, application Italy, Nov. 17, 1993, MI93A2443

Int. Cl.[6] C07C *43/30*

U.S. Cl. 568—615 **12 Claims**

1. Process for preparing peroxidic perfluoropolyethers, having molecular weight M higher than 5000 and content by weight of peroxidic oxygen lower than 4% of the total weight, consisting of reacting tetrafluoroethylene with oxygen in liquid phase comprising a solvent, at temperature from −100° C. to 20° C. and in the presence of a chemical initiator selected from the group consisting of fluorine and perfluoroalkyl hypofluorites containing from 1 to 3 carbon atoms, characterized in that the molar ratio of the tetrafluoroethylene to the chemical initiator is from 35 to 150 and the total pressure is in the range from 2 to 15 absolute atm.

5,488,182

PHENOL COMPOUNDS CONTAINING METHOXYMETHYL GROUP OR HYDROXYMETHYL GROUP

Fumikazu Kobayashi; Kazuyoshi Mizutani, and Kazuo Maemoto, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

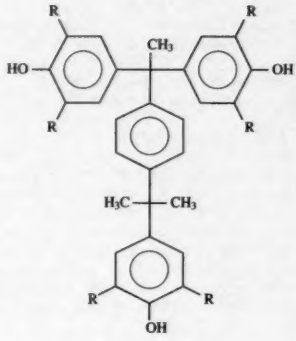
Filed Jun. 30, 1994, Ser. No. 269,040

Claims priority, application Japan, Jun. 30, 1993, 5-161256; Aug. 9, 1993, 5-197474; Aug. 24, 1993, 5-209170

Int. Cl.[6] C07C *39/16*

U.S. Cl. 568—660 **5 Claims**

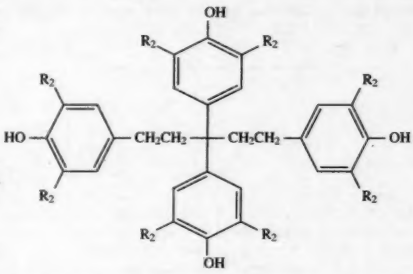
1. A methoxymethyl-containing phenol compound represented by the following formula (I):



(I)

wherein each R represents CH_2OCH_3, CH_2OH, or H, provided that at least three of the R's are CH_2OCH_3 or CH_2OH, with at least one thereof being CH_2OCH_3.

4. A hydroxymethyl-containing phenol compound represented by the following formula (IV):



(IV)

wherein each R_2 represents CH_2OCH_3, CH_2OH or H, provided that at least two of the R_2's are CH_2OH.

5,488,183

ACETYLENIC CYCLOHEXANE TRIOL DERIVATIVES

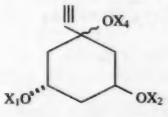
Hector F. DeLuca, Deerfield; Heinrich K. Schnoes, and Fariba Aria, both of Madison, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 410,858, Mar. 27, 1995, which is a division of Ser. No. 302,399, Sep. 8, 1994, Pat. No. 5,430,196, which is a continuation of Ser. No. 926,829, Aug. 7, 1992, abandoned. This application May 23, 1995, Ser. No. 448,105

Int. Cl.[6] C07C *35/08;* **C07F** *7/08*

U.S. Cl. 568—828 **1 Claim**

1. Compounds of the formula,



where X_1, X_2 and X_4 each represent, independently, hydrogen or a hydroxy-protecting group.

5,488,184

PROCESS FOR THE PREPARATION OF ALKKYLENE GLYCOLS

Willem G. Reman, and Eugene M. G. A. Van Kruchten, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 31, 1995, Ser. No. 381,452

Claims priority, application European Pat. Off., Jan. 31, 1994, 94200255

Int. Cl.[6] C07C *29/00;31/20;31/22*

U.S. Cl. 568—867 10 Claims

1. A process for the preparation of alkylene glycols which comprises reacting an alkylene oxide with water in the presence of a catalyst composition comprising a solid material having one or more electropositive sites, which are coordinated with one or more anions other than metalate or halogen anions, with the proviso that when the solid material is an anionic exchange resin of the quaternary ammonium type and the anion is bicarbonate, the process is performed in the substantial absence of carbon dioxide.

5,488,185

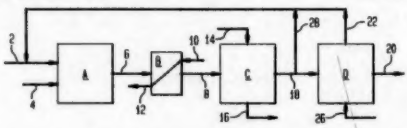
PROCESS FOR THE PRODUCTION OF ETHANOL AND ISOPROPANOL

Ramakrishnan Ramachandran, Allendale, and Loc H. Dao, Bound Brook, both of N.J., assignors to The BOC Group, Inc., New Providence, N.J.

Continuation-in-part of Ser. No. 129,637, Sep. 30, 1993, abandoned. This application Apr. 22, 1994, Ser. No. 231,560

Int. Cl.[6] C07C *29/04;31/08;31/10;7/12*

U.S. Cl. 568—896 15 Claims



1. A process for the production of ethanol comprising the steps:

(a) contacting an ethene-ethane mixture and water with a hydration catalyst in a reaction zone under conditions which result in the production of a gaseous product containing ethanol, unreacted ethene and ethane;

(b) recovering said ethanol from said gaseous product;

(c) selectively adsorbing ethene from the substantially ethanol-free gaseous product by passing at least part of the substantially ethanol-free gaseous product through an adsorption zone containing 4A zeolite adsorbent at a temperature above about 50° C.;

(d) regenerating said adsorbent, thereby producing an ethene-enriched gas stream; and

(e) recycling said ethene-enriched gas stream to said reaction zone.

5,488,186

GAS PHASE PROCESS FOR THE HYDRATION OF PROPYLENE

Stephen H. Brown, Princeton, N.J., and Jeffrey C. Trewella, Kennett Square, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

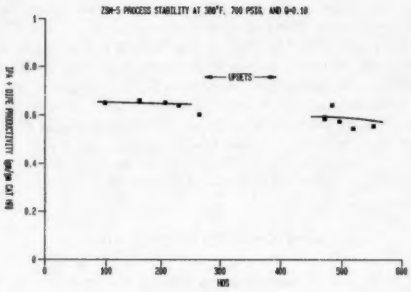
Filed Mar. 22, 1995, Ser. No. 408,244

Int. Cl.[6] C07C *29/04;31/10*

U.S. Cl. 568—897 10 Claims

1. A process for the production of isopropanol with high selectivity, high catalyst productivity and long catalyst life comprising:

contacting water and a feedstream comprising propylene in the gas phase with acidic medium pore, shape selective metallo-silicate catalyst particles under propylene hydration conditions at a water:propylene mole ratio between 0.05 and



0.499, whereby said isopropanol is produced at a selectivity of at least 70 weight percent and catalyst productivity is at least 0.1 unit weight of oxygenates comprising isopropanol/unit weight of catalyst per hour.

5,488,187

PROCESS FOR THE PRODUCTION OF DINITROBENZENE AND MONONITROBENZENE

Robert W. Mason, Lake Charles, La., assignor to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 108,035, Aug. 17, 1993, Pat. No. 5,354,924, which is a continuation-in-part of Ser. No. 210,549, Jun. 22, 1988, abandoned. This application Aug. 15, 1994, Ser. No. 290,575

Int. Cl.[6] C07C *205/06*

U.S. Cl. 568—932 12 Claims

1. A process for nitrating benzene to produce dinitrobenzene by a liquid phase nitration reaction of anhydrous nitric acid with benzene in a reactor at a reaction temperature of between 30° C. and 70° C., and a reaction pressure not exceeding atmospheric pressure, said reaction employing a molar ratio of nitric acid plus any water to benzene of between 15:1 and 25:1, said reaction being conducted in the absence of sulfuric acid, and in the absence of any aprotic dipolar solvent during the reaction and in the absence of any aprotic dipolar solvent to halt the reaction, to produce said dinitrobenzene in a product mixture, followed by vacuum distillation of the product mixture, in the absence of any aprotic dipolar solvent, to remove unreacted nitric acid from said product mixture thereby providing a dinitrobenzene product.

5,488,188

PROCESS FOR THE PREPARATION OF (E)-1-AMINO-2-(FLUOROMETHYLENE)-4-(P-FLUOROPHENYL)BUTANE, NOVEL PROCESSES FOR PREPARING AN INTERMEDIATE THEREOF, AND NOVEL INTERMEDIATES THEREOF

Jonathan C. Evans; Christian T. Goralski, both of Midland; Cynthia L. Rand, Sanford, and Paul C. Vosejpka, Midland, all of Mich., assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Sep. 29, 1994, Ser. No. 315,041

Int. Cl.[6] C07C *25/13;19/08;21/18*

U.S. Cl. 570—128.000 2 Claims

1. The compound (E)-1-chloro-2-(fluoromethylene)-4-(p-fluorophenyl)butane.

5,488,189

PROCESS FOR FLUORINATED PROPANES AND PENTANES

Allen C. Sievert, Elkton, Md., and Mario J. Nappa, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 14, 1993, Ser. No. 166,431
Int. Cl.[6] C07C 21/18;19/08
U.S. Cl. 570—172 28 Claims

1. A process for making halopropanes and pentanes which comprises:

(i) contacting

(a) a dihalodifluoromethane, $CXYF_2$, where X and Y are independently Cl or Br, with

(b) a fluoroolefin which is at least one of tetrafluoroethylene and chlorotrifluoroethylene, wherein the molar ratio of dihalodifluoromethane to fluoroolefin is at least 1:1, in the presence of

(c) a modified aluminum chloride catalyst under conditions sufficient to produce at least one of a perhalofluoropropane having 5 to 6 fluorine and 2 to 3 nonfluorohalogen substituents totaling 8 halogens and at least one perhalo fluoropentane having 8 to 10 fluorine and 2 to 4 nonfluorohalogen substituents totaling 12 halogen substituents, the fluorine content of said propanes and pentanes being the sum of the fluorine contents of the (a) and (b) reactants; and

(ii) recovering at least one of said perhalopropanes and pentanes.

5,488,190

PREPARTION OF VINYL CHLORIDE BY ULTRAPYROLYSIS OF 1,2-DICHLOROETHANE

Jean-Marc Le Blevec, Port Louis; Yves Correia, Chateau Arnoux; Jean-Jacques Masini, Chaponost; Jacques Bousquet, Irigny, all of, France, and Maurice A. Bergougnou, London, Canada, assignors to Elf Atochem S.A., Puteaux, France

Filed Apr. 21, 1993, Ser. No. 49,498
Claims priority, application France, Apr. 21, 1992, 92 04853
Int. Cl.[6] C09C 17/25
U.S. Cl. 570—226 15 Claims

1. A process for the preparation of vinyl chloride, comprising intimately contacting, in the absence of steam, a feedstream of 1,2-dichloroethane with a heated flow of solid particulates capable of providing sufficient heat exchange to flash transfer a dehydrochlorinating amount of thermal energy to said 1,2-dichloroethane and thereby ultrapyrolyzing at least a fraction of same into vinyl chloride and HCl, and recovering said vinyl chloride from the medium of ultrapyrolysis, wherein said heated flow of fluid or solid particulates is heated before coming into contact with said feedstream of 1,2-dichloroethane where said solid particulates are silica, corundum-type alumina or attapulgite silicoaluminates.

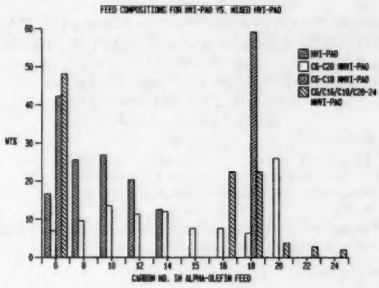
5,488,191

HYDROCARBON LUBE AND DISTILLATE FUEL ADDITIVE

Alice S. Chu, Spotswood; Andrew Jackson, Pennington, and Margaret M. Wu, Skillman, all of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jan. 6, 1994, Ser. No. 178,152
Int. Cl.[6] C10M 143/06
U.S. Cl. 585—10 20 Claims

1. A hydrocarbon lubricant additive suitable as a pour point depressant, cloud point depressant and viscosity index improver, said additive comprising the copolymer residue of a mixture of 1-alkene comonomers selected from the group consisting of C_3-C_{28} 1-alkenes, wherein said copolymer contains at least 10 weight percent of recurring monomeric units of C_{14}-C_{24} 1-alkenes;



has a number average molecular weight between 5,000 and 60,000; and a molecular weight distribution between 1 and 10; said additive containing a bimodal distribution of said 1-alkenes in said residue, said distribution having a first maximum between C_3 and C_{14} 1-alkenes and a second maximum between C_{14} and C_{26} 1-alkenes.

5,488,192

METHOD FOR INHIBITING THE POLYMERIZATION OF STYRENE

Vladimir A. Kourbatov, Moscow; Nataljya P. Boreyko; Valerii P. Zouev, both of Nischnekamsk, and Alexandr G. Liakumovich, Kazan, all of, Russian Federation, assignors to Kourbatov, Moscow, Russian Federation

Filed May 5, 1994, Ser. No. 238,670
Int. Cl.[6] C07C 5/333
U.S. Cl. 585—435 8 Claims

1. In a process for the preparation of styrene, a method for preventing the spontaneous polymerization of styrene wherein an inhibiting composition of 3,5-di-tert-butyl-4-hydroxy-N,N-dimethylbenzyl amine and a carboxylic acid, or an anhydride of said carboxylic acid, in an organic solvent, is added to a styrene-containing mixture, the improvement comprising:

a) supplying air simultaneously with the inhibiting composition in a weight ratio of 3,5-di-tert-butyl-4-hydroxy-N,N-dimethylbenzyl amine to carboxylic acid to air, said ratio being 1:1–0.05:0.05–15.

5,488,193

PROCESS FOR REDUCING POLYNUCLEAR AROMATIC MUTAGENICITY BY ALKYLATION

Carl R. Mackerer, Pennington; Timothy A. Roy, Hopewell, both of N.J., and Gary R. Blackburn, Washington Crossing, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 202,720, Feb. 23, 1994, abandoned, which is a continuation of Ser. No. 972,398, Nov. 6, 1992, abandoned. This application Jan. 25, 1995, Ser. No. 378,308
Int. Cl.[6] C07C 2/66
U.S. Cl. 585—455 8 Claims

1. A process for reducing the mutagenicity of a hydrocarbonaceous refinery stream containing polynuclear aromatic compounds having three to seven fused aromatic rings, the stream having an initial mutagenicity index value greater than about 0.0, comprising the step of:

(a) contacting the polynuclear aromatic containing refinery stream in the presence of an alkylating agent having from three to five carbon atoms with an acid catalyst under alkylation conditions sufficient to monoalkylate or dialkylate the polynuclear aromatic compounds of the refinery stream with a branched chain alkyl group of three to five carbon atoms to reduce the mutagenicity of the alkylated polynuclear aromatic containing refinery stream to a level less than the initial mutagenicity index value.

5,488,194

SELECTIVE PRODUCTION OF PARA-DIALKYL SUBSTITUTED BENZENES AND CATALYST THEREFOR

Jeffrey S. Beck, Princeton, and Ralph M. Dessau, Edison, both of N.J., assignors to Mobil Oil Corp., Fairfax, Va.

Filed May 16, 1994, Ser. No. 242,828

Int. Cl.[6] **C07C** *5/52;2/66*

U.S. Cl. 585—475 **17 Claims**

1. A process for selective production of para-dialkyl substituted benzene which comprises converting a feedstock comprising

(1) mono-alkyl substituted benzene having an alkyl group of from 1 to 4 carbon atoms, or

(2) a mixture of said mono-alkyl substituted benzene or benzene with an alkylating agent containing from 1 to 4 carbon atoms,

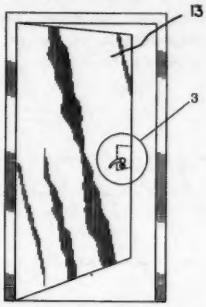
to product comprising para-dialkyl substituted benzene containing alkyl groups of 1 to 4 carbons at conversion conditions with a catalyst comprising a porous crystalline material having the structure of MCM-49, said crystalline material having been treated with one or a combination of selectivating agent compounds selected from the group consisting of silicones, Siloxanes having at least two siloxane units, and silanes, whereby the treated crystalline material has an Alpha Value of from about 10 to about 2000, a p-xylene sorption capacity greater than about 1 gram/100 grams of crystalline material, said sorption capacity being measured at 120° C. and a p-xylene pressure of 4.5±0.8 mm of mercury.

5,488,195

AUTOMATICALLY ACTUATED SOUND APPARATUS

Thattil J. Mickel, Thattil House, P.O. Valapad, Trichur Kerala, Ind.

Filed Feb. 18, 1994, Ser. No. 199,009
Int. Cl.[6] G06F *7/04;* **G10H** *1/26*
U.S. Cl. 84—609 **11 Claims**



1. A new and improved automatically actuated sound apparatus, comprising:

a wave transmitter unit mounted on a door,

a sound generating unit which includes a wave receiver assembly for receiving wave energy from said door-mounted wave transmitter unit and a sound generating assembly which is activated by said wave receiver assembly,

a door lock assembly mounted on the door, and

a transmitter actuator assembly, attached to a portion of said door lock assembly, for actuating said door-mounted wave transmitter unit,

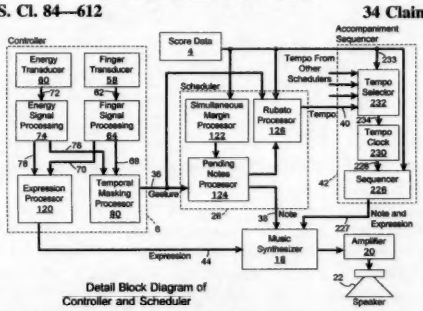
wherein said door lock assembly is mounted in a first housing portion, said door-mounted wave transmitter unit is mounted in a second housing portion, a slot is provided between said first housing portion and said second housing portion, and said transmitter actuator assembly projects from said first housing portion through said slot into said second housing portion for actuating said door-mounted wave transmitter unit.

5,488,196

ELECTRONIC MUSICAL RE-PERFORMANCE AND EDITING SYSTEM

Thomas G. Zimmerman, 7611 Hollanderry Pl., Cupertino, Calif. 95014, and Samuel P. Wantman, 1124 Page St. Apt. #3, San Francisco, Calif. 94117

Filed Jan. 19, 1994, Ser. No. 183,489
Int. Cl.[6] G10H *1/02;1/42;1/46*
U.S. Cl. 84—612 **34 Claims**



Detail Block Diagram of Controller and Scheduler

1. A music re-performance system to generate music in response to musical gestures of a player comprising;

(a) storage means for storing information defining at least note pitch and note timing in at least one preprogrammed musical channel;

(b) finger transducer means for receiving finger manipulations from a player and for generating and for outputting a finger signal in response to said finger manipulations;

(c) energy transducer means for receiving energy applied by a player and for generating and outputting an energy signal in response to said energy applied to said energy transducer means by the player;

(d) signal processing means connected to said finger transducer means and to said energy transducer means for receiving said finger signal and said energy signal and for generating at least one gesture signal in response to said finger signal and to said energy signal;

(e) scheduling means connected to said storage means and to said signal processing means, for sequentially selecting at least one note from said storage means and for transmitting the selected note in response to said gesture signal; and

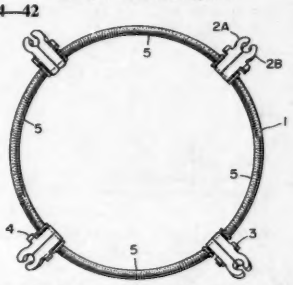
(f) sound generator means connected to said scheduling means for receiving the transmitted selected note and for producing sound in response to said selected notes.

5,488,197

METHOD OF SPACING TRANSMISSION LINE SUBCONDUCTORS

Albert S. Richardson, Jr., 3 Wingate Rd., Lexington, Mass. 02173

Continuation of Ser. No. 61,183, May 13, 1993, Pat. No. 5,362,920. This application Jul. 14, 1994, Ser. No. 274,954
The portion of the term of this patent subsequent to May 13, 2013, has been disclaimed.
Int. Cl.[6] H02G *7/12;7/14*
U.S. Cl. 174—42 **6 Claims**



1. A method of spacing multiple subconductors relative to each other while allowing the subconductors to vibrate without causing damage to the subconductors, the method comprising the steps of:

gripping each subconductor with a corresponding clamp, each clamp being secured about a rigid hoop in a manner such that each clamp is capable of sliding along the hoop and rotating about the hoop; and

separating the clamps from each other along the hoop with springs which are positioned about the hoop and spaced between the clamps.

5,488,198

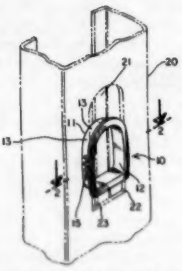
PROTECTION DEVICE FOR APERTURES IN METAL STUDS OR PANELS

Hy Kramer, 50 Carter Dr., Stamford, Conn. 06902

Filed Sep. 1, 1994, Ser. No. 299,590
Int. Cl.[6] H02G *3/26*
U.S. Cl. 174—48 **5 Claims**

1. A protection device for wires and tubes which is attached along the opposing rims of an aperture in metal studs or the like comprising:

a body made of a flexible plastic material defined by a wall having opposing sides and having an inner and outer wall surface said opposing sides being bowed outwardly so that the device can be pinched into attachment with the opposing rims of an aperture in a metal stud;



a flange, said flange is formed around the periphery of said wall;

one or more male nubs protrude from each of the opposing sides of the outer wall surface of said body at an angle of less than 90 degrees, in the gap facing the flange, thereby defining a gap between said nubs and said flange for receiving, therebetween, the opposing rims of the aperture in a metal stud.

5,488,199

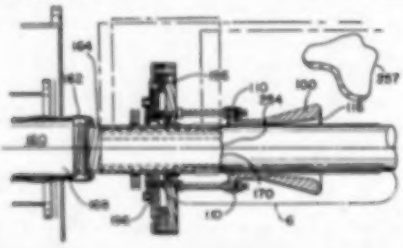
ELECTRICAL-STRESS-CONTROLLED SOLID DIELECTRIC CABLE TERMINATION ASSEMBLY

Jorgen Selsing, Oak Forest, and Mac A. Thompson, Frankfort, both of Ill., assignors to G & W Electric Company, Blue Island, Ill.

Filed Sep. 20, 1991, Ser. No. 763,187

Int. Cl.[5] H02G *15/103*

U.S. Cl. 174—73.1 **16 Claims**



1. An electrical-stress-controlled solid dielectric cable termination assembly comprising:

an electrical cable;

said electrical cable including a center conductor, a solid dielectric insulating layer arranged concentrically around said conductor, a partially conductive layer arranged concentrically around said solid dielectric insulating layer, and a shield conductor arranged concentrically around said partially conductive layer;

a substantially cylindrical electrically conductive wall;

said conductive wall forming a central bore for receiving said center conductor;

said conductive wall being electrically connected to said shield conductor;

and an insulating coating applied to said conductive wall;

said conductive wall having a thickness and said insulating coating having a thickness which is substantially consistent and substantially smaller than said conductive wall thickness;

said conductive wall having a central longitudinal axis;

said wall having a first portion having inner and outer walls substantially parallel to said axis; and

said wall having a second portion attached to said first portion, said second portion having at least one wall inclined to said axis.

5,488,200

INTERCONNECT STRUCTURE WITH REPLACED SEMICONDUCTOR CHIPS

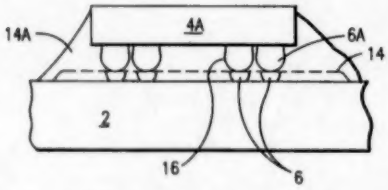
Yutaka Tsukada, Shiga, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 976,619, Nov. 16, 1992, Pat. No. 5,355,580. This application Jun. 8, 1994, Ser. No. 255,596

Claims priority, application Japan, Dec. 26, 1991, 3-3448221

Int. Cl.[6] H05K *1/18*

U.S. Cl. 174—261 **30 Claims**



1. An interconnect structure, comprising:

a first substrate with a surface;

a pattern of multiple conductive pads defining an area on the surface of the first substrate;

conductive bumps with first ends positioned on the conductive pads, and second ends of the bumps defined by a second surface approximately parallel to and above the surface of the first substrate and which defines the flat, distal ends of the bumps wherein the second surface is mountable to an electronic device having additional conductive bumps; and a first layer of an encapsulant filing around the bumps in the volume defined by the area of the pattern of conductive pads and between the first substrate surface and the defining second surface.

5,488,201

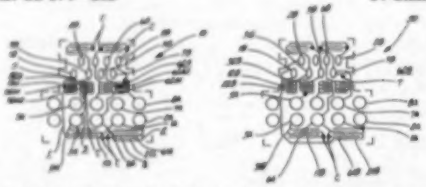
LOW CROSSTALK ELECTRICAL SIGNAL TRANSMISSION MEDIUM

Danny Liu, Taipei, Taiwan, Prov. of China, assignor to Dan-Chief Enterprise Co., Ltd., Taipei, Taiwan, Prov. of China

Filed Dec. 16, 1994, Ser. No. 357,390

Int. Cl.[6] H05K *1/02*

U.S. Cl. 174—262 **14 Claims**



1. A low crosstalk electrical signal transmission medium comprising:

a plurality of input ends for inputting therethrough signals;

a plurality of signal transmission lines respectively electrically connected to said plurality of input ends and being folded into bends and electrically coupled to form a mutually corresponding capacitive arrangement for restoring an electric balance of said signal transmission lines in order to reduce a crosstalk between said signal transmission lines; and

a plurality of output ends respectively electrically connected to said signal transmission lines for outputting therethrough signals.

5,488,202

WEIGHING DEVICE FOR THE REGISTRATION OF GOODS IN STORES

Günter Baitz, and Rainer Ihlenburg, both of Berlin, Germany, assignors to Siemens Nixdorf Informationssysteme Aktiengesellschaft, Paderborn, Germany

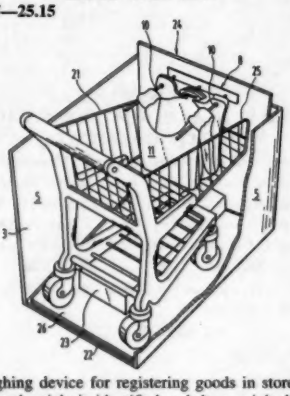
PCT No. PCT/EP91/02368, § 371 Date Jun. 9, 1993, § 102(e) Date Jun. 9, 1993, PCT Pub. No. WO92/10122, PCT Pub. Date Jun. 25, 1992

PCT Filed Dec. 10, 1991, Ser. No. 74,843

Claims priority, application Germany, Dec. 10, 1990, 40 39 377.1

Int. Cl.[6] G01G *19/40*

U.S. Cl. 177—25.15 **14 Claims**



1. A weighing device for registering goods in stores, in which each purchased article is identified and then weighed for weight-registration purposes, comprising:

a floor scale operable to weigh articles placed on a weighing portion,

a support mounted on said weighing portion of said floor scale and projecting upwardly approximately to waist level,

a suspension means mounted on said support close to an upper end of said support for suspending at least one carrying container which is removable from said suspension means,

a standing container having upwardly extending walls, said standing container extending at least partly about said floor scale and being free of said weighing portion of said floor scale,

a weighing receptacle resting on said weighing portion and including a receiving container in an interior of said standing container and being free of said standing container to permit weighing movement between said weighing receptacle and said standing container, said weighing receptacle being a shopping container which can be pushed into said interior of said standing container and onto said weighing portion of said floor scale, said suspension means being disposed above said shopping container.

5,488,203

FORCE COMPENSATOR FOR INERTIAL MASS MEASUREMENT INSTRUMENT

David R. Hassel, Wynantskill, and Lauren R. Basch, East Greenbush, both of N.Y., assignors to Rupprecht & Patashnick Company, Inc., Albany, N.Y.

Filed Nov. 5, 1993, Ser. No. 147,852

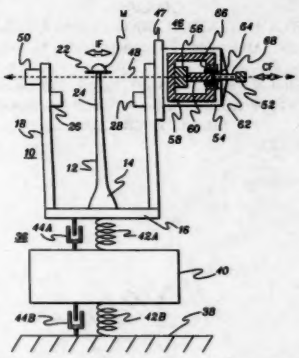
Int. Cl.[6] G01G *21/10;3/14;* **G01N** *29/00*

U.S. Cl. 177—184 **19 Claims**

1. An inertial mass measurement instrument exhibiting enhanced accuracy, comprising:

an elastic element having a first portion for supporting matter to be measured and a second portion secured to a primary support;

means for driving the elastic element into oscillation at a resonant frequency which varies with mass loading;



means for sensing changes in resonant frequency as a measure of mass loading; and

electrically driven compensating force applying means acting on the primary support for actively compensating for inertial forces resulting from oscillation of the elastic element so that energy transfer and dissipation out of the oscillating elastic element through the primary support into a secondary support supporting the primary support, including any suspension system of the secondary support suspending the primary support, is minimized in order to avoid secondary support property changes from compromising mass measurements.

5,488,204

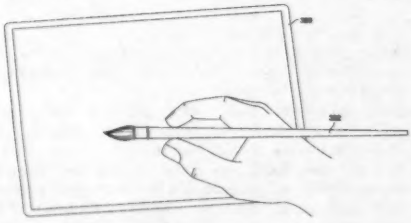
PAINTBRUSH STYLUS FOR CAPACITIVE TOUCH SENSOR PAD

Carver A. Mead, Pasadena; Ralph Wolf, Palo Alto, and Timothy P. Allen, Los Gatos, all of Calif., assignors to Synaptics, Incorporated, San Jose, Calif.

Continuation-in-part of Ser. No. 300,630, Sep. 2, 1994, which is a continuation-in-part of Ser. No. 300,387, Sep. 2, 1994, which is a continuation-in-part of Ser. No. 115,743, Aug. 31, 1993, Pat. No. 5,374,787, which is a continuation-in-part of Ser. No. 895,934, Jun. 8, 1992, abandoned. This application Oct. 17, 1994, Ser. No. 324,438

Int. Cl.[6] G08C *21/00*

U.S. Cl. 178—18 **11 Claims**



1. A conductive paintbrush stylus for use with a capacitive touch sensor pad comprising:

an electrically conductive handle;

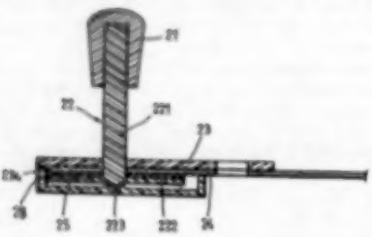
a plurality of electrically conductive bristles affixed to said handle;

wherein the total resistance of said handle and said bristles is no more than the skin resistance of a human finger.

5,488,205
HEARING AID TUBING CONNECTOR
Mikko Majoe, Ambridge, Pa., assignor to Microsonic, Inc., Ambridge, Pa.
Continuation of Ser. No. 113,905, Sep. 1, 1993, abandoned. This application Feb. 6, 1995, Ser. No. 384,697
Int. Cl.[6] H04R 25/00
U.S. Cl. 181—129 16 Claims

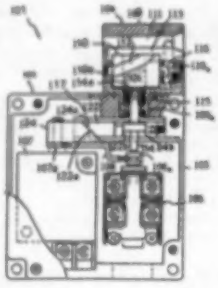
1. A connector for connecting sound conduction tubing from a hearing aid to a sound conduction horn of an earmold, comprising:
a body member having an outer surface and having a bore therethrough with a first end and a second end, said bore being sized to allow said sound conduction tubing to pass through said bore from said first end to said second end and be snugly received in said bore; and
retaining means formed on said outer surface of said body member for engaging said bore of said earmold and retaining said connector therein.

5,488,206
JOYSTICK SWITCH ASSEMBLY
Donald Wu, 12F., No. 59, Chung Chen Road, Taipei, Taiwan, Prov. of China
Continuation-in-part of Ser. No. 180,808, Jan. 31, 1994. This application Dec. 22, 1994, Ser. No. 361,487
Int. Cl.[6] H01H 25/04
U.S. Cl. 200—6 A 6 Claims



1. A joystick switch assembly comprising:
a housing with an open-top defining a storage chamber, said housing comprising a recessed bearing block located on the inside bottom of said housing;
a cover shell covered on said housing, said cover shell comprising a center through hole, and an annular bottom flange located on one side of said cover shell;
a stick, said stick comprising a contact plate received within the storage chamber of said housing, a stick body raised from one side of said contact plate at the center and extended out of the center through hole on said cover shell, and a stub rod raised from an opposite side of said contact plate at the center and supported on said recessed bearing block;
a membrane circuit mounted around said stick body and disposed between said cover shell and the contact plate of said stick, said membrane circuit having a through hole, through which said stick body of said stick passes, and an extension portion having conductor lines, wherein the extension portion extends out of said housing; and
a circular conductive rubber mounted around said stick body and disposed between said membrane circuit and the contact plate of said stick and received within said annular flange of said cover shell, having a through hole through which said stick body of said stick passes;
wherein when said stick is moved within said housing, said contact plate is forced to press said conductive rubber and said membrane circuit, causing said membrane circuit to produce a location signal output corresponding to the direction of the movement of said stick such that the location signal output is transmitted along the extension portion by the conductor lines.

5,488,207
KEY SWITCH WITH A LOCKING ARRANGEMENT ON A ROTATING ELEMENT
Takashi Niwa, 483, Shatoyamada, 6-1, Minamigohanochyou Sagahirasawa, Ukyuku, Kyoto Si; Kenji Shinohara, 201, Newshatou Nagaoka No. 2, 2 Chyoume, Kugai, Nagaokakyoushi, Kyoto Fu, and Makito Murii, Takatsuki Dohashi Ryo 3-10, Dohashi Chyou Takatsukishi, Osada Fu, all of, Japan
Filed Feb. 1, 1993, Ser. No. 11,628
Claims priority, application Japan, Jan. 31, 1992, 4-016127; Apr. 10, 1992, 4-090744
Int. Cl.[6] H01H 27/00
U.S. Cl. 200—43.04 6 Claims



1. A key switch, comprising:
a switching element to control an electric status of an external device;
a first actuator having a changeable position to actuate said switching element;
a rotating element, with a guide to control its rotation, which changes the position of said first actuator;
a first locking mechanism having means to immobilize said rotating element;
a key;
a means, responsive to said key, for disengaging said first locking mechanism and rotating said rotating element;
an electromagnetic solenoid activated in response to an external signal;
a second locking mechanism mechanically connected with said electromagnetic solenoid having means to prevent said key from being removed;
a second actuator for said switching element which is mechanically connected with said electromagnetic solenoid; and
a housing to enclose said switching element, said first actuator, said rotating element, said first locking mechanism, said electromagnetic solenoid, said second locking mechanism, and said second actuator, with an opening into which said key can go.

5,488,208

MULTIPLE ELECTRICAL OUTLET BOX WITH LOCKING COVER AND POWER INTERRUPT SWITCH

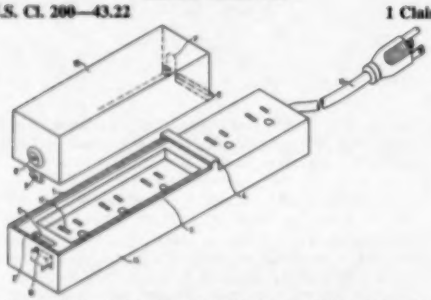
Gerhard Seewald, Moosaecker 14, Eckental, Germany

Filed Sep. 23, 1994, Ser. No. 310,563

Claims priority, application Germany, Jan. 5, 1993, 9315054 U

Int. Cl.[6] H01H 9/28

U.S. Cl. 200—43.22 **1 Claim**



1. A multiple electrical outlet box having multiple outlets and an attached power cable for supplying power to said outlets, wherein at least one electrical plug adapted to be connected to one of said outlets is secured against removal from said electrical outlet box by a locking cover positioned on said outlet box and which encloses said multiple outlets and said plug when said plug is attached to one of said outlets, said cover including a keylock wherein a key for activating said keylock moves a mechanical latch in a locking position to thereby lock said cover to said outlet box and also disables an electrical switch wherein said switch enables electric power from the power cable to reach said outlets when said switch is enabled and prevents power from said power cable from reaaching said outlets when said switch is disabled and whereby at least one of said outlets is not covered by said cover when said cover is locked to said outlet box.

5,488,209

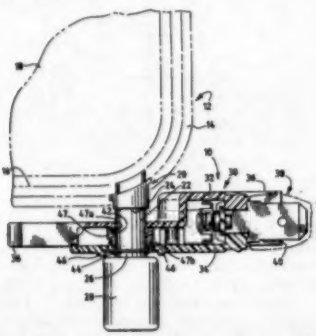
HINGE OPERATED SWITCH ASSEMBLY

Mario M. V. Orrico, Chicago; William J. Olson, Barrington; James S. Zielinski, Schaumburg, and Randall M. Crippen, Chicago, all of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Dec. 29, 1994, Ser. No. 368,153

Int. Cl.[6] H01H 3/16

U.S. Cl. 200—61.7 **20 Claims**



1. A switch assembly for activation by a shaft of a hinge mechanism operatively connected to a first component, which is rotatable with respect to a second component, such that an electrical switch of an electrical circuit is controlled in response to rotatable movement of said first component and said shaft of said hinge mechanism with respect to said second component, comprising:

a cam member connected to said shaft of said hinge mechanism for rotation along with said shaft of said hinge mechanism;

an electrical switch for controlling an electrical circuit;

a lever having a first portion mounted within said switch assembly such that said lever is movable with respect to said electrical switch, and a second portion in operable communication with said electrical switch; and

actuating means having a first portion operably connected to said cam member for rotation along with said cam member and said shaft of said hinge mechanism, and a second portion for engagement with a third portion of said lever such that upon rotation of said cam member and said shaft of said hinge mechanism between a first rotary position of said first component with respect to said second component and a second rotary position of said first component with respect to said second component, said second engagement portion of said actuating means will cause said lever to move to a first position at which said electrical switch is closed, and will permit said lever to move to a second position at which said electrical switch is opened.

5,488,210

PUSH BUTTON SWITCH

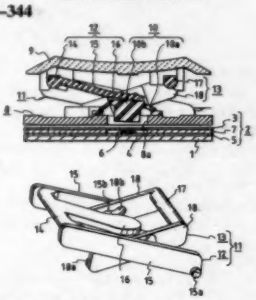
Hiroshi Shigetaka, and Yasuhide Orita, both of Iwaki, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 69,891, Jun. 1, 1993, abandoned. This application Feb. 16, 1995, Ser. No. 390,266

Claims priority, application Japan, Jun. 11, 1992, 4-152163; Jul. 16, 1992, 4-189444; Aug. 4, 1992, 4-208116; Sep. 1, 1992, 4-233792

Int. Cl.[6] H01H 3/12

U.S. Cl. 200—344 **9 Claims**



1. A push button switch comprising:

a key top having front and rear surfaces, and first and second shafting support parts formed on the rear surface;

a baseplate formed with third and fourth shafting part receiving slots;

a switch element made electrically conductive with up-and-down motions of said key top;

an elastic member, located between said key top and said baseplate, for biasing said key top away from said baseplate;

a first arm member including a first shafting part provided at a first end thereof, the first shafting part being rotatably connected to said first shafting support part of said key top, the first arm member also including a third shafting part provided at a second end thereof and slidably rotatably received in said third shafting part receiving slot, and a first joint part located between the first end and the second end; and

a second arm member including a second shafting part provided at a third end thereof, the second shafting part being rotatably connected to said second shafting support part of said key top, the second arm member also including a fourth shafting part provided at a fourth end thereof and slidably rotatably received in said fourth shafting part receiving slot, and a

second joint part located between the third end and the fourth end and rotatably slidably joined to said first joint part, said second arm member being connected crosswise to said first arm member at said second joint part;

wherein one of said first joint part and said second joint part includes a protrusion and the other of the first joint part and the second joint part includes a curved slot receiving said protrusion.

5,488,211

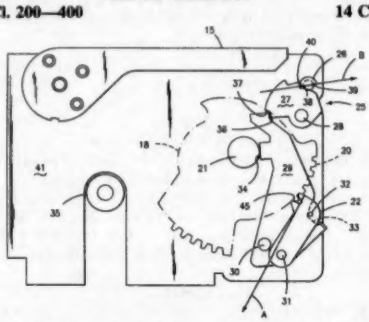
LATCHING ARRANGEMENT FOR HIGH AMPERE-RATED CIRCUIT BREAKER OPERATING SPRINGS

Roger N. Castonguay, 5 Ellen Dr., Terryville, Conn. 06786; James L. Rosen, 478 Fern St., West Hartford, Conn. 06107, and Mark A. Zaffetti, 10 Town Line Rd., Windsor Locks, Conn. 06096

Filed Mar. 28, 1994, Ser. No. 218,287

Int. Cl.[6] H01H *3/30*

U.S. Cl. 200—400 **14 Claims**



1. An industrial-rated circuit breaker for high level overcurrent protection comprising:

an insulative base **11**;

an insulative cover **13** above said base, said cover enclosing a closing shaft **21** and a drive shaft **35** extending between a pair of operating mechanism sideframes **41,42**;

a closing spring **43** connecting with said closing shaft, said closing spring receiving forces for moving said spring into a charged condition;

a handle **15** interacting with said closing shaft through a handle drive gear **18** allowing an operator to provide said forces; and

a closing latch arrangement operatively connecting a locking pawl with said handle drive gear when said operating spring is receiving said forces and releasing said locking pawl from said handle drive gear when said spring becomes fully charged.

5,488,212

SWITCHING DEVICE FOR AN ON-LOAD TAP CHANGER

Akira Fukushi, and Tomio Yamaguchi, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 19, 1994, Ser. No. 326,098

Claims priority, application Japan, Jan. 19, 1993, 5-260292

Int. Cl.[6] H01H *5/08*

U.S. Cl. 200—400 **10 Claims**

1. A switching device for a tap changer comprising:

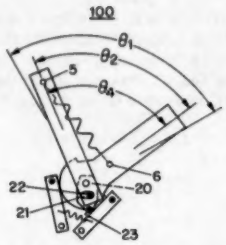
a shaft;

an input lever rotatably mounted on to the shaft;

a clutch, rotatably attached to the shaft, having a slot;

a latching apparatus for engaging the clutch;

an output lever, rotatably attached to the shaft, for making contact with a selected one of a first tap and a second tap, said output lever having a cammed surface at a base thereof for



securing a position of said output lever to make contact with the first tap and for engaging the latching apparatus to prevent said output lever from rotating about the shaft;

a spring for pulling the output lever toward the input lever; and

a pin, fixedly attached to the input lever and disposed within the slot, for driving the clutch to engage the latching apparatus;

whereby when the input lever is pulled away from the output lever by a predetermined angle, said pin drives the clutch against the latching apparatus to free the cammed surface from the latching apparatus, allowing the output lever to rotate about the shaft, and the output lever is then pulled by the spring toward the input lever to make contact with the second tap.

5,488,213

LOW-PROFILE KEYBOARD KEY

Jörg Dittrich, Ammerthal, Germany, assignor to Cherry Mikroschalter GmbH, Auerbach, Germany

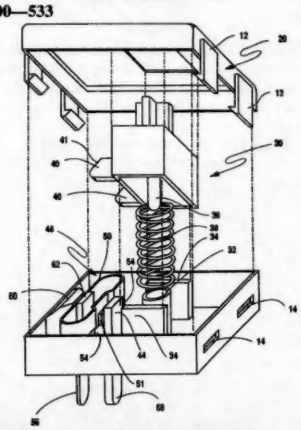
PCT No. PCT/EP92/02205, § 371 Date Jun. 15, 1994, § 102(e) Date Jun. 15, 1994, PCT Pub. No. WO93/10546, PCT Pub. Date May 27, 1993

PCT Filed Sep. 23, 1992, Ser. No. 232,205

Claims priority, application Germany, Nov. 21, 1991, 41 38 339.7; Feb. 4, 1992, 42 03 120.6

Int. Cl.[6] H01H *3/42*

U.S. Cl. 200—533 **12 Claims**



1. A mechanically operable electrical switch element comprising a plunger supported in a housing so movable in a predetermined direction for opening or closing an electrical contact formed between a stationary contact element and a movable contactor, said plunger comprising two trigger cams projecting therefrom perpendicularly to the direction of movement of the plunger for actuating the electrical contact with a movement of the contact portion of the contactor in a direction perpendicularly to the direction of movement of the plunger, said contactor consisting of a sheet metal part bent to an elongate oval shape having essentially flat opposite sides

and bent opposite ends at the greatest extent thereof, said sheet metal part being disposed in a plane normal to the direction of movement of said plunger, and arranged in the switch element in such a manner that its greatest extent is also perpendicular to the direction of movement of the contact portion, and said contact element and said movable contact portion being disposed between said two trigger cams.

5,488,214

INDUCTIVE COOKING POINT HEATING SYSTEM

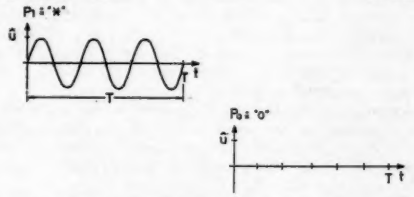
Guenter Fettig, Karlsruhe-Groetzingen; Juergen Horn, Krailchtal; Franz Bogdanski, Oberderdingen, and Willi Essig, Boeblingen, all of, Germany, assignors to E.G.O. Elektro-Gerate Blanc u. Fischer, Germany

Continuation of Ser. No. 30,858, Mar. 12, 1993, abandoned. This application May 4, 1995, Ser. No. 435,002

Claims priority, application Germany, Mar. 14, 1992, 42 08 252.8

Int. Cl.[6] H05B *6/08;6/12*

U.S. Cl. 219—627 **10 Claims**



1. An induction cooker heating system having induction coil means and high frequency oscillating current generating means for energizing said coil means and having electronic control means for controlling the oscillating current generating means, the electronic control means comprising means for controlling oscillation packets for generating different power stages by different switch-on patterns, each switch-on pattern comprising a combination of basic patterns, each basic pattern consisting of complete AC voltage half-waves within a specific constant time interval, said time interval being defined by an integral multiple of said AC voltage waves, each switch-on pattern containing the same number of positive and negative AC voltage half-waves.

5,488,215

SWIVEL CONNECTION

Joachim Aronsson, Hönö, Sweden, assignor to Rotech Tooling, Sweden

PCT No. PCT/SE92/00730, § 371 Date Apr. 21, 1994, § 102(e) Date Apr. 21, 1994, PCT Pub. No. WO93/07986, PCT Pub. Date Apr. 29, 1993

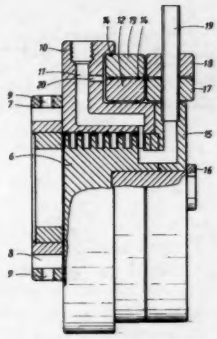
PCT Filed Oct. 20, 1992, Ser. No. 211,958

Claims priority, application Sweden, Jan. 21, 1991, 9103051

Int. Cl.[6] B23K *11/36*

U.S. Cl. 219—86.25 **12 Claims**

1. A swivel connection for attachment to a robot arm for the supply of a fluid therethrough to associated tool means comprising a rotatable, cylindrical hub having a first transverse surface, a second transverse surface and an outer cylindrical surface, and attachment means on said first transverse surface for attachment to said robot arm, a non-rotatable coupling member having an inner surface surrounding said outer surface of said cylindrical hub, first and second concentric contact members juxtaposed with said coupling member and electrically isolated from each other and from said coupling member, a cover member on said second transverse surface of said cylindrical hub and rotatable therewith, first and second concentric ring members surrounding said cover member, said first concentric ring member juxtaposed with said first concentric contact member and said second concentric ring member juxtaposed with said second concentric contact member, said first



and second concentric ring members being electrically isolated from each other and from said cover member, said coupling member including coupling member channel means extending therethrough including a first externally accessible end and a second end on said inner surface of said coupling member proximate to said outer cylindrical surface of said cylindrical hub, said cylindrical hub including hub channel means extending therethrough including a first end proximate to said second end of said coupling member channel means and a second end proximate to said cover member, said cover member including cover member channel means extending therethrough including a first end proximate to said second end of said hub channel means and a second end proximate to said first and second concentric ring members, and said first and second concentric ring members including ring member channel means extending therethrough, including a first end proximate to said second end of said cover member channel means and a second end for attachment to said tool means associated with said robot, whereby said fluid can be supplied from said first end of said coupling member channel means to said second end of said ring member channel means during rotation of said swivel connection.

5,488,216

PROTECTIVE GAS FOR THE LASER WELDING OF ALUMINUM

Alfward Farwer, Meerbusch, Germany, assignor to Messer Griesheim GmbH, Germany

Filed Aug. 10, 1994, Ser. No. 288,081

Claims priority, application Germany, Aug. 30, 1993, 43 29 127.9

Int. Cl.[6] B23K *26/14*

U.S. Cl. 219—121.64 **8 Claims**

1. A protective gas for the laser welding of aluminum, comprising a primary gas selected from the group consisting of argon, helium and argon/helium mixtures, said primary gas having an addition of 80 vpm to 250 vpm of an additive gas selected from the group consisting of N_2, N_2O and N_2/N_2O mixture.

5,488,217

HIGH CURRENT CONTINUOUS WELDING DEVICE

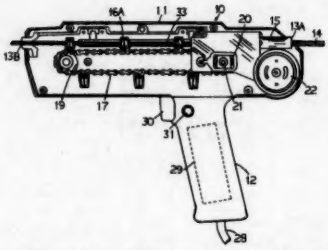
Jian M. Ni, 75 Springbrook Drive, Richmond Hill, Ontario, Canada

Filed Sep. 12, 1994, Ser. No. 343,021

Int. Cl.[6] B23K *9/133*

U.S. Cl. 219—137.31 **8 Claims**

1. A portable continuous welding apparatus for use with an



elongated welding electrode having a welding flux coating provided in equal length sections over a metal core wherein adjacent sections are spaced from each other by a gap exposing a portion of said metal core therein, comprising

a portable housing having an inlet means for receiving said welding electrode to be inserted therein, and an outlet means for directing said welding electrode exiting from said housing towards a welding area,

a drive wheel means rotatably mounted in said housing,

a free wheel means rotatably mounted in said housing,

a continuous drive chain means mounted over said drive wheel means and said free wheel means,

a drive motor means coupled to said drive wheel means and being operative to rotate said drive wheel means for driving said drive chain means,

a plurality of pairs of carrier means mounted at equal intervals on said drive chain means, each pair of carrier means comprising a first carrier means mounted on one side of said drive chain means and a second carrier means mounted on a second side of said drive chain means and located directly opposite to said one side, and said first carrier means and second carrier means having inner surfaces facing each other, a first brush means mounted on said first carrier means and a second brush means mounted on said second carrier means, said first brush means and second brush means extending outwards from said inner surfaces towards each other and being spaced from each other at a distance substantially equal to the diameter of said metal core of said welding electrode, said first carrier means having a rear surface therein and a first horizontal V-shaped channel formed in said rear surface of said first carrier means, said second carrier means having a rear surface therein and a second horizontal V-shaped channel formed in said rear surface of said second carrier means,

a first elongated bus bar means disposed in a spaced manner along one side of said drive chain means, said first elongated bus bar means having a front surface therein disposed parallel to and facing said welding electrode, a first V-shaped ridge formed on said front surface, said first horizontal V-shaped channel of said first carrier means being slidably engageable with said first V-shaped ridge on said first elongated bus bar means,

a second elongated bus bar means disposed in a spaced manner along a second side of said drive chain means, said second elongated bus bar means having a front surface therein disposed parallel to and facing said welding electrode, a second V-shaped ridge formed on said front surface, said second horizontal V-shaped channel of said second carrier means being slidably engageable with said second V-shaped ridge on said second elongated bus bar means,

said first elongated bus bar means and second elongated bus bar means being connected to a source of welding current supply whereby the welding current is supplied to said welding electrode through said first brush means and second brush means operatively in contact with said metal core.

5,488,218

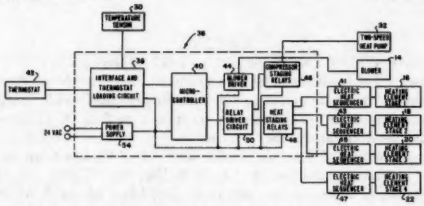
ELECTRIC HEAT CONTROL APPARATUS AND METHOD

Mark W. Olsen, Carrollton; Joe R. Powell, Garland; Russell C. Tharp, Ft. Worth, and Stephen A. Walter, Flower Mound, all of Tex., assignors to Lennox Industries Inc., Dallas, Tex.

Filed Feb. 12, 1993, Ser. No. 17,689

Int. Cl.[6] H05B *1/02*

U.S. Cl. 219—492 **10 Claims**



1. In a heating system having a supply air duct in communication with an enclosure, an air mover for moving air in a predetermined direction within the duct to provide a supply air stream to the enclosure, a plurality of heaters located in the duct for heating the supply air stream and a thermostat for providing a demand for heat signal in response to the enclosure temperature being less than a predetermined temperature setting, apparatus for controlling the heaters, said apparatus comprising:

temperature sensing means at a selected location in the duct downstream from the heaters in the predetermined direction for sensing temperature of the supply air stream at said selected location and for providing an indication of sensed temperature; and

control means responsive only to the demand for heat signal and to an indication that the sensed temperature is less than a predetermined first temperature for sequentially activating one or more heaters until the sensed temperature is greater than or equal to said first temperature, said control means being further responsive only to the demand for heat signal and to an indication that the sensed temperature is greater than a predetermined second temperature which is greater than said first temperature for sequentially deactivating one or more of the activated heaters until the sensed temperature is less than or equal to said second temperature, said control means being responsive to cessation of the demand for heat signal for deactivating all of the activated heaters.

5,488,219

INDUCTION HEATING COIL ASSEMBLY AND METHOD FOR HARDENING INNER SURFACE OF CYLINDER BY USING THE SAME

Yoshimasa Tanaka, and Hisashi Tabuchi, both of Hiratsuka, Japan, assignors to Neturen Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1994, Ser. No. 341,872

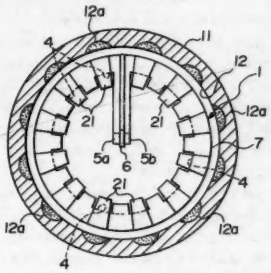
Claims priority, application Japan, Dec. 13, 1993, 5-311941; Mar. 29, 1994, 6-059229

Int. Cl.[6] H05B *6/38*

U.S. Cl. 219—644 **16 Claims**

1. A method of hardening an inner surface of a cylinder by using an induction heating coil assembly which comprises a conductive induction member having a substantially cylindrical shape, for forming a hardened layer in the inner wall of an external cylindrical member to be heated which is provided apart from the conductive induction member, by generating an induced current in the inner wall of the external cylindrical member, wherein a plurality of recess portions are formed on the inner wall of the conductive induction member at predetermined spaces circumferentially; comprising the steps of:

flowing high frequency current through said conductive induction member at a first position thereof with respect to said external cylindrical member, to heat separate portions on a first circumferential line of the inner wall of said external



cylindrical member which correspond to the plurality of recess portions of said conductive induction member by generation of induced currents in the inner wall of said external cylindrical member, and thereby to form a plurality of hardened layers at said separate portions on said first circumferential line;

transferring said conductive induction member to a second position with respect to said external cylindrical member along the central axis of said external cylindrical member; and thereafter,

flowing high frequency current through said conductive induction member at the second position thereof with respect to said external cylindrical member, to heat separate portions on a second circumferential line of the inner wall of said external cylindrical member which correspond to the plurality of recess portions of said conductive induction member by generation of induced currents in the inner wall of said external cylindrical member, and thereby to form a plurality of hardened layers at said separate portions on the second circumferential line.

5,488,220

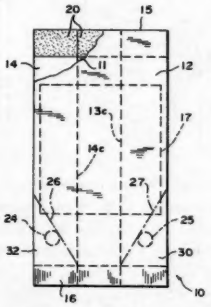
BAG FOR MICROWAVE COOKING

Randall C. Freerks, Little Rock, and Marvin A. Strouth, Ashton, both of Iowa, assignors to Union Camp Corporation, Princeton, N.J.

Filed Jul. 29, 1994, Ser. No. 282,647

Int. Cl.[6] H05B *6/80*

U.S. Cl. 219—727 **18 Claims**



1. A bag for popping popcorn in a microwave oven, comprising:

a pair of substantially rectangularly shaped front and back face panels having top and bottom ends and opposite side edges;

a pair of opposite side panels coterminous in length with the face panels and joining the opposite side edges of the front and back face panels, said side panels each having a longitudinal accordion pleat therein defining longitudinally extending gusset folds in the side panels;

bag closure means securing the top and bottom ends of the front and back face panels and the gusseted side panels together to close and seal the top and bottom ends of the bag, forming a cooking chamber inside the bag;

said gusseted side panels being expandable about the folds therein during cooking of food in the bag to enlarge the interior volume of the bag, and when unfolded to the expanded position, forming triangularly shaped corner flaps at the junctures of the gusseted side panels and the front and back face panels, respectively, said corner flaps each having a folded edge extending diagonally from the respective side panel toward the adjacent closed end of the bag, and having confronting, contiguous, triangularly shaped surface portions between the respective side panel and the adjoining front and back face panels; and

attachment means joining the confronting surface portions between the side panels and at least one of the front and back face panels at least at one end of the bag immediately adjacent the diagonal folded edge and spaced from the adjacent bag closure means to hold the confronting surface portions in contiguous relationship when the bag is fully expanded, thereby preventing the formation of pockets or spaces between the confronting surface portions in which food might otherwise collect.

5,488,221

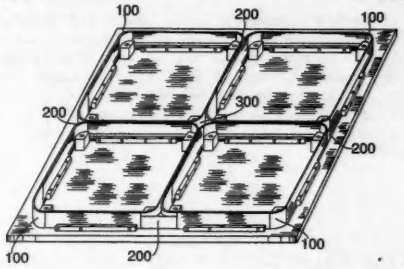
SLOT INTERLOCK CONNECTORS FOR RF WELDING ELECTRODES

Louis Amabile, and Andrew L. Amabile, both of 582 Grand Ave., Lindenhurst, N.Y. 11757

Filed Jan. 18, 1995, Ser. No. 374,115

Int. Cl.[6] H05B *6/54*

U.S. Cl. 219—765 **19 Claims**



1. A connector for connecting a first high frequency welding electrode to a second high frequency welding electrode on a backing plate, said connector comprising:

a connector electrode having a first upper working edge and first and second end edges which are substantially orthogonal to said first upper working edge; and

a first integral mounting block for mounting said connector on the backing plate, said first integral mounting block having a first upper surface which is lower than said first upper working edge and first and second end surfaces, each of said first and second end surfaces overshadowing a respective end edge of said connector electrode and providing a substantially flat alignment surface adjacent to said respective end edge of said connector electrode, whereby,

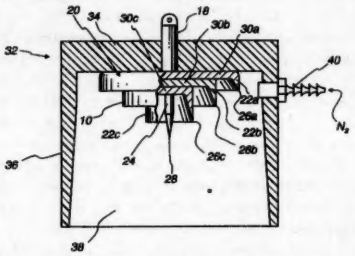
an end of the first high frequency welding electrode is aligned with said first end edge of said connector electrode by said first end surface of said first integral mounting block and an end of the second high frequency welding electrode is aligned with said second end edge of said connector electrode by said second end surface of said first integral mounting block.

5,488,222

ELECTRODE ARRANGEMENT FOR CREATING CORONA AND METHOD OF TREATING ELECTRICALLY-CONDUCTIVE SURFACES

Michael J. Gault, 4618 Compass Rose, #21, Vermilion, Ohio 44089, and Ernest H. Pfaff, 1549 Woodvale Ave., Deerfield, Ill. 60015

Filed Sep. 16, 1994, Ser. No. 307,198
Int. Cl.[6] H01T *19/00*
U.S. Cl. 250—324 **20 Claims**



1. An electrode arrangement for creation of a corona over an area for surface treatment of an article with the corona, the electrode arrangement being configured for attachment to a high frequency corona generator and having an electrode made of an electrically conductive material, comprising

a. a stem for attachment to the corona generator,

b. a corona driving portion mounted on said stem,

c. a corona emitting portion in electrical contact with said corona driving portion,

d. said corona driving portion being configured in relation to said corona emitting portion such that corona from the electrode arrangement is emitted essentially from said corona emitting portion in a direction away from said corona driving portion,

e. an electrically insulative shroud for said electrode, said shroud including means for attachment of said shroud to said electrode and having a corona guide spaced from said electrode and extending essentially in the direction that corona is emitted, creating a corona cavity in said shroud, and

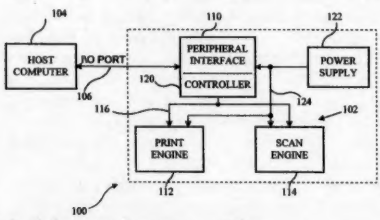
f. means for introducing a gas into said corona cavity, said gas enveloping said electrode and a surface of an article to be treated.

5,488,223

SYSTEM AND METHOD FOR AUTOMATIC SELECTION OF PRINTER CONTROL PARAMETERS

Pixie A. Austin, Everett; Duane M. Fox, Snohomish, and Christopher A. Wiklof, Everett, all of Wash., assignors to Intermec Corporation, Everett, Wash.

Filed Sep. 13, 1994, Ser. No. 305,204
Int. Cl.[6] G06F *15/20*
U.S. Cl. 235—375 **24 Claims**



1. A printing control system comprising:

a print medium on which an output image can be printed, said print medium including a symbology containing a print characteristic of said print medium;

a reader to read said symbology and generate control signals representative of said print characteristic;

a printer to print said output image on said print medium, said printer having an adjustable printer operating parameter which controls the printing of a first output image;

a controller responsive to said control signals to selectively adjust said printer operating parameter of said printer to control the printing of said first output image on said print medium by said printer; and

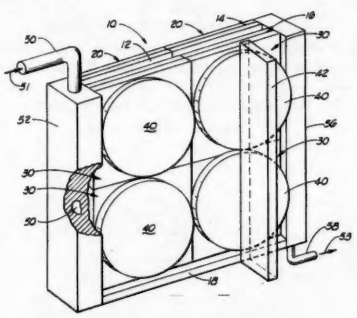
an analyzer to monitor said first output image and determine a quality value for said first output image, said analyzer dynamically altering said printer operating parameter in response to said quality value to alter the printing of a second output image printed subsequent to said first output image.

5,488,224

SYSTEM FOR CHARACTERIZING FLOW PATTERN, PRESSURE AND MOVEMENT OF A FLUID

John E. Fagan; James J. Sluss, Jr.; John W. Hassell; R. Brian Mears; Ronnie B. Beason; Sonja R. Wilkinson; Tommy Lear, and Kok S. Tan, all of Norman, Okla., assignors to Gas Research Institute, Chicago, Ill.

Continuation of Ser. No. 125,046, Sep. 21, 1993, Pat. No. 5,326,969, which is a division of Ser. No. 965,828, Oct. 22, 1992, Pat. No. 5,271,675. This application Mar. 31, 1994, Ser. No. 221,322
The portion of the term of this patent subsequent to Jul. 5, 2011, has been disclaimed.
Int. Cl.[6] H01J *5/16;* **G01K** *1/14*
U.S. Cl. 250—227.16 **84 Claims**



1. An apparatus for viewing a flow of a fluid disposed between two facings used for testing the fluid, the apparatus comprising:

a first facing having a front surface and a rear surface;

a second facing having a front surface and a rear surface, the second facing disposable opposite and spaceable apart from the first facing wherein a gap is formed therebetween for containing the fluid;

a light source for providing light;

a plurality of transmitting fiber optic members at least partially disposed within the first facing;

a plurality of receiving fiber optic members at least partially disposed within the second facing for receiving light transmitted from the plurality of transmitting fiber optic members; and

means for converting light received by the receiving fiber optic member into an image of the flow of the fluid.

5,488,225

ROTARY SCANNER AND LIGHT BEAM SCANNING SYSTEM HAVING A SPECIFIED RELATIONSHIP BETWEEN THE FACETS OF THE SCANNING MIRROR AND THE COMMUTER SEGMENTS OF THE MOTOR

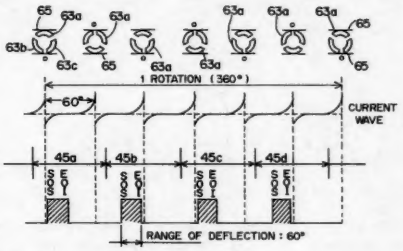
Koji Hiramatsu, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 3, 1994, Ser. No. 253,341

Claims priority, application Japan, Jun. 7, 1993, 5-136259; Jul. 27, 1993, 5-185038

Int. Cl.[6] H01J *3/14*

U.S. Cl. 250—236 17 Claims



1. A rotary scanner comprising:

a mirror with at least one deflecting facet for deflecting a light beam; and

a motor for rotating the mirror, the motor having a plurality of commutator segments and brushes, at least one commutation position, where a brush is released from contact with a commutator segment and comes into contact with another commutator segment, being visible from outside.

5,488,226

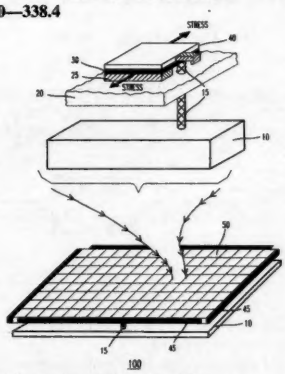
INFRARED IMAGING ARRAY BASED ON TEMPERATURE DRIVEN ANISOTROPIC OPTICAL ABSORPTION

Gerald J. Iafrate, Raleigh, N.C.; Mitra Dutta, Tinton Falls; Paul H. Shen, Howell, both of N.J., and Michael A. Stroscio, Durham, N.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 18, 1994, Ser. No. 341,774

Int. Cl.[6] H01L *31/06*

U.S. Cl. 250—338.4 28 Claims



1. A thermal imaging device comprising:

a substrate having an anisotropic thermal expansion coefficient;

bottom contact means bonded to the substrate, said bottom contact means having a lengthwise axis;

a multiple quantum well epilayer displaced on the bottom contacts, said multiple quantum well epilayer having a thermal expansion coefficient; and

means to electrically contact the multiple quantum well epilayer without contacting the substrate;

wherein the substrate is formed such that thermal expansion coefficient of the substrate is matched to that of the MQW epilayer in the direction parallel to the lengthwise axis of the bottom contact means and so that the thermal expansion coefficient of the substrate normal to the lengthwise axis of the bottom contact means is not matched, and wherein when thermal radiation is incident to the multiple quantum well epilayer, an anisotropic strain is displaced along the multiple quantum well epilayer due to the difference of the thermal expansion coefficients of the multiple quantum well epilayer and the substrate whereby an anisotropic absorption is induced in said multiple quantum well epilayer by the uniaxial strain.

5,488,227

GAS ANALYZER

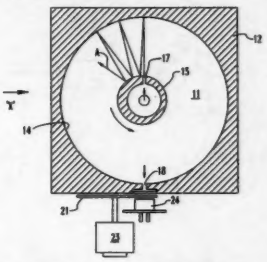
Christopher R. Sweet, Leicestershire, England, assignor to Geotechnical Instruments (UK) Limited, United Kingdom

Filed Oct. 11, 1994, Ser. No. 320,674

Claims priority, application United Kingdom, Jan. 8, 1993, 9320756

Int. Cl.[6] G01N *21/61*

U.S. Cl. 250—343 19 Claims



1. A sample chamber for a gas detector, the chamber having a gas sample inlet, and defining an inlet path for a beam of energy, an exit path for said beam of energy and reflector means whereby said beam of energy is in use reflected from said inlet path to said exit path, said reflector means including a concave reflector surface and a convex reflector surface.

5,488,228

SADDLE FIELD SOURCE

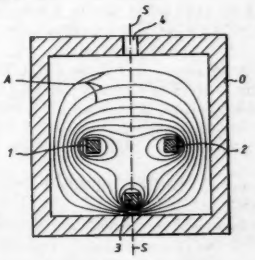
Hermann Dobler, Aalen, Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Germany

Filed Oct. 11, 1994, Ser. No. 321,325

Claims priority, application Germany, Jan. 8, 1993, 43 34 357.0

Int. Cl.[6] H01J *37/08;* H05H *3/00*

U.S. Cl. 250—423 R 16 Claims



1. An electrostatic saddle field source comprising:
a chamber having an exit opening defining a preferred direction and said chamber defining a center plane perpendicular to said preferred direction;
a plurality of electrodes mounted in said chamber to produce an electric field defining a saddle when voltage is applied to said electrodes;
gas supply means for supplying a gas to said chamber which is ionized to produce particles of which a portion passes from said chamber through said exit opening in said direction as a particle beam when said voltage is applied; and,
said electrodes being disposed in said chamber so as to define an arrangement of said electrodes which is asymmetrical with respect to said center plane and said electric field likewise being asymmetrical with respect to said center plane.

5,488,229

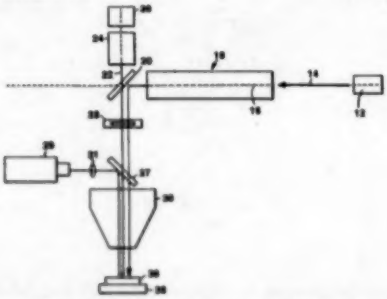
DEEP ULTRAVIOLET MICROLITHOGRAPHY SYSTEM

David J. Elliott, Wayland, Mass., and David Shafer, Fairfield, Conn., assignors to Excimer Laser Systems, Inc., Wayland, Mass.

Filed Oct. 4, 1994, Ser. No. 317,314

Int. Cl.[6] **G21K** *5/04*

U.S. Cl. 250—492.2 **19 Claims**



1. A high resolution, deep UV beam photolithography system comprising a deep UV radiation source for generating a beam of deep ultraviolet radiation along a path, mask receiving structure in said path, a first optical system in said path for homogenizing and shaping the deep UV energy in said path; and a second optical system in said path for directing radiation energy onto the surface of a substrate to be processed, said second optical system including large area mirror structure having a numerical aperture of at least 0.3 and a plurality of refractive elements disposed between said mask receiving structure and said substrate for compensating (reducing) image curvature introduced into the system by said large area mirror structure, said second optical system providing a focal point outside any one of said refractive elements.

5,488,230

DOUBLE-BEAM LIGHT SOURCE APPARATUS, POSITION DETECTING APPARATUS AND ALIGNING APPARATUS

Hideo Mizutani, Yokohama, and Kazuya Ota, Tokyo, both of, Japan, assignors to Nikon Corporation, Tokyo, Japan

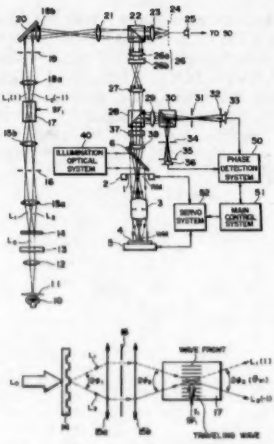
Filed Jul. 14, 1993, Ser. No. 91,501

Claims priority, application Japan, Jul. 15, 1992, 4-187198; Feb. 12, 1993, 5-024441; Feb. 19, 1993, 5-029530; Feb. 19, 1993, 5-029531

Int. Cl.[6] **G01N** *21/86;* **H04N** *1/00*

U.S. Cl. 250—548 **29 Claims**

28. A double-beam light source apparatus comprising:
a light source system for supplying a beam, said light source system having a light source for generating a beam including



light of plural wavelengths and a collimating optical system for condensing the beam from said light source; and
frequency difference producing means for receiving the beam outgoing from said light source means to split it into two beams and producing a predetermined frequency difference between said two beams to output said two beams radially spreading;
wherein transmission optical path lengths of the two beams are identical to each other and the two beams having said predetermined frequency difference are made separately outgoing.

5,488,231

METAL/SEMICONDUCTOR JUNCTION SCHOTTKY DIODE OPTICAL DEVICE USING A DISTORTION GROWN LAYER

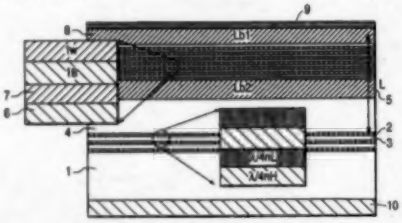
O-Kyun Kwon, Daejeon; Young-Wan Choi, Seoul, and El-Hang Lee, Daejeon, all of, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon-shi, Rep. of Korea

Filed Dec. 9, 1994, Ser. No. 352,628

Claims priority, application Rep. of Korea, Nov. 23, 1994, 94-30898

Int. Cl.[6] **H01L** *27/14;31/00*

U.S. Cl. 257—17 **3 Claims**



1. A metal/semiconductor junction Schottky diode optical device formed on a structure comprising:
a plurality of GaAs mirror and AlAs mirror layers grown on a semi-insulating GaAs substrate, one of an n+ and a p+ semiconductor layer formed on said GaAs mirror and AlAs mirror layers, a GaAs buffer layer formed on said one of said n+ and p+ semiconductor layer providing a Schottky metal layer serving as an electrode and a mirror, and a multiple quantum well structure having an electro-optical absorption characteristic, formed between said one of said n+ and p+ semiconduc-

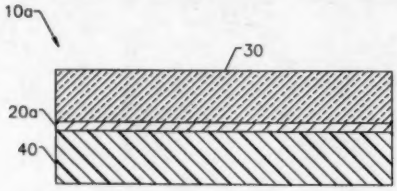
tor layer and Schottky metal layer, to provide a diode with said multiple quantum well structure.

5,488,232

ORIENTED DIAMOND FILM STRUCTURES ON NON-DIAMOND SUBSTRATES

Jeffrey T. Glass, Apex; Denise T. Simendinger, and Peter T. Goeller, both of Raleigh, all of N.C., assignors to North Carolina State University, Raleigh, N.C.

Filed Sep. 28, 1993, Ser. No. 128,365
Int. Cl.[6] H01L *29/161;29/20;29/22*
U.S. Cl. 257—77 **15 Claims**



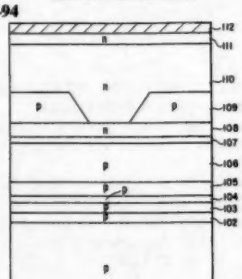
8. A semiconductor device comprising:
a non-diamond substrate;
a first layer on the non-diamond substrate, the first layer comprising a metal silicide; and
a second layer on the first metal silicide layer, the second layer comprising a semiconducting oriented diamond wherein portions of said oriented diamond layer are in alignment with a lattice of corresponding portions of said non-diamond substrate.

5,488,233

SEMICONDUCTOR LIGHT-EMITTING DEVICE WITH COMPOUND SEMICONDUCTOR LAYER

Masayuki Ishikawa, Yokohama; Yukie Nishikawa, Narashino; Shinji Saito; Peter J. Parbrook, both of Kawasaki; Masaaki Onomura, Tokyo; Koichi Nitta, and Genichi Hatakoshi, both of Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 11, 1994, Ser. No. 208,850
Claims priority, application Japan, Mar. 11, 1993, 5-051102; Jun. 25, 1993, 5-154691; Sep. 10, 1993, 5-225362
Int. Cl.[6] H01L *33/00*
U.S. Cl. 257—94 **24 Claims**



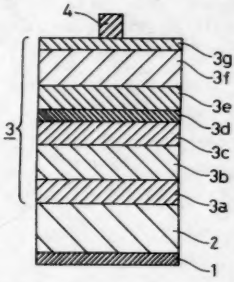
1. A semiconductor light-emitting device comprising:
a semiconductor substrate consisting of a compound semiconductor of elements in the third and fifth groups of the periodic table;
a first compound semiconductor layer formed directly on at least a portion of said semiconductor substrate and consisting of a compound semiconductor containing at least In and P; and
a second compound semiconductor formed directly on said first compound semiconductor layer and consisting of a compound semiconductor of elements in the second and sixth groups of the periodic table.

5,488,234

SEMICONDUCTOR ELEMENT HAVING BIVALENT AND VI GROUP ELEMENT AND AN INSULATING LAYER

Shigeo Yoshii, Nagaokakyo; Kazuhiro Okawa, Moriguchi; Ayumi Tsujimura, Takatsuki, and Tsuneo Mitsuyu, Hirakata, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 17, 1994, Ser. No. 214,281
Claims priority, application Japan, Mar. 18, 1993, 5-058241; Mar. 25, 1993, 5-066569
Int. Cl.[6] H01L *33/00;29/22;31/0256;31/0296*
U.S. Cl. 257—94 **10 Claims**



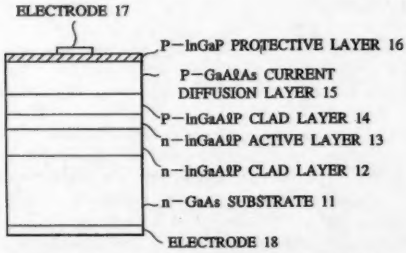
1. A semiconductor element comprising a compound of at least one bivalent element and at least one VI group element, wherein said semiconductor element has an insulating layer, said insulating layer comprising ions implanted on at least one n-type semiconductor layer of the semiconductor element in an amount from 10^{12} ions/cm^2 to 10^{18} ions/cm^2, wherein said implanted ions are at least one element selected from the group the consisting of I group and V group.

5,488,235

SEMICONDUCTOR LIGHT-EMITTING ELEMENT AND METHOD FOR MANUFACTURING THEREFOR

Hideki Nozaki, Kawasaki, and Kazumi Unno, Yokohama, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 209,731, Mar. 14, 1994, abandoned. This application Jun. 1, 1995, Ser. No. 456,609
Claims priority, application Japan, Mar. 15, 1993, 5-053539; Sep. 29, 1993, 5-242914
Int. Cl.[6] H01L *33/00;27/15;31/12*
U.S. Cl. 257—94 **10 Claims**



1. A semiconductor light-emitting element comprising:
an active layer;

a high aluminum crystal layer formed on said active layer and formed from aluminum of a high mol ratio ≧60%; and

a conductive crystal layer formed on a light producing surface of said high aluminum crystal layer, said conductive crystal layer containing aluminum of a mol ratio ≦50%,

wherein said conductive crystal layer fully covers the light producing surface of said high aluminum crystal layer.

5,488,236

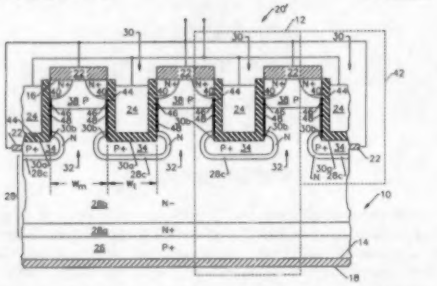
LATCH-UP RESISTANT BIPOLAR TRANSISTOR WITH TRENCH IGFET AND BURIED COLLECTOR

B. Jayant Baliga, Raleigh, N.C., and Jacek Korec, Mörfelden-Walldorf, Germany, assignors to North Carolina State University, Raleigh, N.C.

Filed May 26, 1994, Ser. No. 249,449

Int. Cl.[6] H01L *29/74;31/111*

U.S. Cl. 257—132 **19 Claims**



1. A semiconductor switching device comprising:

a semiconductor substrate having first and second opposing faces;

an anode contact on the first face;

a cathode contact of the second face;

an anode region in said substrate, ohmically contacting said anode contact at the first face;

a first conductivity type region in said substrate and on said anode region, opposite the first face, said first conductivity type region comprising a buffer region, which forms a first P—N junction with said anode region, and a drift region on said buffer region, said drift region having a doping concentration below that of said buffer region;

a second conductivity type region in said substrate and on said first conductivity type region, opposite said anode region, said second conductivity type region being of same conductivity type as said anode region and forming a second P—N junction with said drift region at a position intermediate the first and second faces;

a cathode region of first conductivity type in said substrate and ohmically contacting said cathode contact, said cathode region forming a third P—N junction with said second conductivity type region;

a buried collector region of second conductivity type in the first conductivity type region and electrically connected to said cathode contact, said buried collector region forming a fourth P—N junction with said drift region at a position intermediate the first face and the second P—N junction; and

means adjacent said second conductivity type region for electrically connecting said cathode region to said first conductivity type region in response to a first bias signal.

5,488,237

SEMICONDUCTOR DEVICE WITH DELTA-DOPED LAYER IN CHANNEL REGION

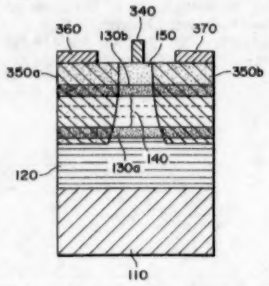
Nobuhiro Kuwata, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Japan

Filed Feb. 11, 1993, Ser. No. 16,263

Claims priority, application Japan, Feb. 14, 1992, 4-028301; Feb. 24, 1992, 4-036411

Int. Cl.[6] H01L *27/12;29/267;29/80*

U.S. Cl. 257—194 **20 Claims**



1. A field effect transistor in which a current flowing between a drain region and a source region is controlled by a voltage applied to a gate electrode, comprising:

a channel region having a multi-layer structure, said multi-layer structure including:

a lower semiconductor layer including a first compound semiconductor,

an electron supply semiconductor layer including a second compound semiconductor and located on said lower semiconductor layer, and

an upper semiconductor layer including said first compound semiconductor and located on said electron supply semiconductor layer, said electron supply semiconductor layer being sandwiched between said lower and upper semiconductor layers,

whereby, when a predetermined threshold voltage is supplied to said gate electrode, a first channel is formed at an interface between said electron supply semiconductor layer and said lower semiconductor layer, and a second channel is formed by electrons falling into a quantum well at an interface between said electron supply semiconductor layer and said upper semiconductor layer, said electrons falling into said well including a first electron which has made a real space transition from said first channel and a second electron which has been supplied from said electron supply semiconductor layer.

5,488,238

ARRANGEMENT OF POWER SUPPLY LINES USED IN A UNIT FUNCTIONAL BLOCK

Motohiro Enraku, and Yutaka Tanaka, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 20,459, Feb. 22, 1993, abandoned, which is a continuation of Ser. No. 720,700, Jun. 25, 1991, abandoned. This application Apr. 18, 1995, Ser. No. 425,333

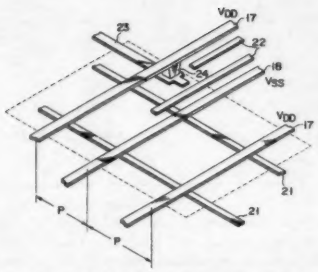
Claims priority, application Japan, Jun. 25, 1990, 2-164321

Int. Cl.[6] H01L *27/10*

U.S. Cl. 257—207 **6 Claims**

1. A semiconductor integrated circuit device having a multilayer structure, comprising:

a pattern arranged in a first direction, said pattern forming at least two circuit blocks having semiconductor elements and having different functions, said pattern being arranged repeatedly in a second direction, said second direction being substantially perpendicular to the first direction, wherein each set of two adjacent patterns are line-symmetric with respect to a corresponding boundary line thereof;



means for transmitting a signal sequentially on said two circuit blocks;

a control signal line pattern formed on a first layer and supplying a common control signal to circuit blocks having an identical circuit structure, said control signal line pattern being arranged along said second directional;

a main power-supply line pattern formed on a second layer and arranged along said first direction on the boundary line of said two patterns arranged in the first direction, said main power-supply line pattern including a pattern of voltage supply lines, each of said voltage supply lines supplying power to two adjacent circuit blocks on either side of said each voltage supply, said each voltage supply line supplying power to said at least two different circuit blocks having different functions arranged in said first direction, said second layer disposed above said first layer; and

a branch power-supply line pattern for electrically connecting said main power-supply line pattern to the semiconductor elements of said circuit blocks, and for actuating said circuit blocks by supplying said semiconductor elements with the power supplied by said main power-supply line pattern.

5,488,239

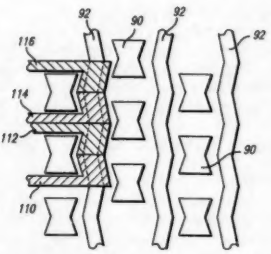
SOLID STATE IMAGE SENSOR WITH SHAPED PHOTODIODES

Hun J. Jung, Seoul, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Rep. of Korea

Filed Jul. 14, 1994, Ser. No. 275,908

Int. Cl.[6] H01L *27/14;31/00*

U.S. Cl. 257—231 **2 Claims**



1. A solid state image sensor comprising:

(a) a plurality of photodiodes arranged such that the photodiodes in odd number columns and the photodiodes in even number columns straddle each other, for generating image signal charges by converting light signals into electrical signals, wherein each of the photodiodes is shaped like a peanut shell having a narrower middle part;

(b) vertical charge coupled devices each formed between the photodiode columns for transmitting the image signal charges generated in each of the photodiodes, vertically; and

(c) a plurality of microlenses each arranged matched with each of the plurality of photodiodes over each of the photodiodes.

5,488,240

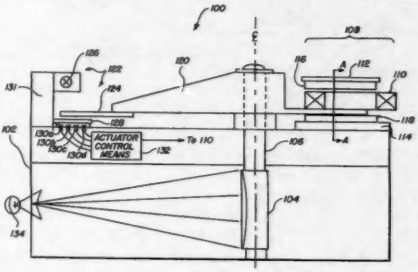
APPARATUS AND METHOD FOR ROTATING AN OPTICAL ELEMENT USING A MOVING COIL IN A CONSTANT MAGNETIC FIELD

Louis Hlousek; K. C. Odencrantz; Richard K. Oswald; Donald W. Dahlin; Saied Motaei; Paul W. Siggins; Kenny Wong; Ronald A. Smith, and Philip M. Scheinert, all of c/o Thermo Separation Products (California) Inc., P.O. Box 5116, 45757 Northport Loop West, Fremont, Calif. 94537

Filed Dec. 27, 1993, Ser. No. 172,899

Int. Cl.[6] H01J *31/50*

U.S. Cl. 250—231.16 **14 Claims**



1. An apparatus for rotating an optical element in response to a light control signal indicative of a desired rotation of said optical element, said apparatus comprising:

a moving coil actuator, coupled to said optical element, for rotating said element;

sensor means for detecting rotation of said optical element, for generating a plurality of rotation signals representative thereof, and for providing said rotation signals to an actuator control means to control rotation of said optical element; and

actuator control means, responsive to said light control signal, for providing an actuation signal to said moving coil actuator to control rotation of said optical element, said actuator control means comprising a microprocessor and logic circuit, responsive to said plurality of rotation signals and said light control signal, for generating a phase shift control signal, for generating a reference signal and for generating a distance-to-go signal indicative of distance of rotation of said element remaining to produce said desired rotation;

error means for phase shifting said plurality of rotation signals and for comparing said phase shifted rotation signals to said reference signal to produce a position error signal and a velocity error signal, said position error signal being provided to said moving coil actuator when said apparatus is in a track follow mode; and deceleration means, responsive to said position and velocity signals, for generating an optimal velocity signal to control said rotation of said element when said apparatus is in an optimal seek mode, said error means comprising a sine table, responsive to said phase shift control signal, for providing a phase shift signal; a phase shifter, responsive to said plurality of rotation signals and said phase shift signal, for generating a plurality of phase shifted signals, said plurality of phase shifted signals being said plurality of rotation signals phase shifted by a phase angle determined by said phase shift signal; and quadrant selector means for comparing said plurality of phase shifted signals and said reference signal, for generating a position error signal based on said comparison and for differentiating said position error signal to produce a velocity error signal.

5,488,241

INTEGRATED DEVICE COMBINING A BIPOLAR TRANSISTOR AND A FIELD EFFECT TRANSISTOR

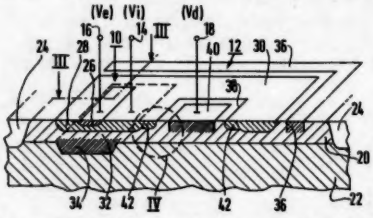
Jacques Journeau, Colomby, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 20, 1994, Ser. No. 278,481

Claims priority, application France, Jul. 22, 1993, 93 09053

Int. Cl.[6] H01L *29/80;29/808*

U.S. Cl. 257—273 **6 Claims**



1. An integrated device formed by the combination of a bipolar transistor (**10**) and a junction field effect transistor (**12**), comprising:

a heavily doped emitter zone (**26**) of a first conductivity type;

a base zone (**28**) which is less heavily doped than the emitter zone, which is of a second conductivity type opposed to the first type, in which the emitter zone (**26**) is included, and which comprises a lateral extension (**30**) forming a gate for the field effect transistor;

a collector zone formed by a portion (**32**) of a weakly doped epitaxial layer (**20**) of the first conductivity type on a weakly doped substrate (**22**) of the second conductivity type, and by a heavily doped buried layer region (**34**) of the first conductivity type extending below the emitter zone (**26**); which device in addition comprises a heavily doped peripheral region (**36**) of the first conductivity type which surrounds the base zone (**28**) and its lateral extension (**30**) at least partly and at a selected distance;

characterized in that the lateral extension (**30**) of the base zone comprises an opening (**38**) in which a drain region (**40**) of the first conductivity type for the field effect transistor is situated, said drain region being heavily doped, completely surrounded by said lateral extension (**30**) and separated therefrom by a given lateral distance (w), and in that the buried layer region (**34**), which is of an elongate shape, extends in a longitudinal direction to beyond the base zone and its lateral extension so as to be covered by said peripheral region (**36**), said peripheral region forming together with the buried layer region (**34**) the source of the field effect transistor (**12**).

5,488,242

SEMICONDUCTOR MEMORY DEVICE

Kazumasa Sunouchi, Yokohama; Hiroshi Takato, Kawasaki; Tohru Ozaki; Naoko Okabe, both of Tokyo; Katsuhiko Hieda, Yokohama; Fumio Horiguchi, Tokyo; Akihiro Nitayama; Takashi Yamada, both of Kawasaki; Kouji Hasimoto, Yokohama, and Satosi Inoue, Suwa, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 620,482, Nov. 29, 1990, abandoned.

This application Nov. 24, 1993, Ser. No. 156,931

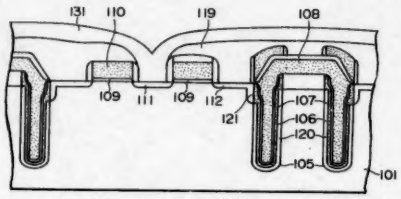
Claims priority, application Japan, Nov. 30, 1989, 1-312192

Int. Cl.[6] H01L *29/78;29/92;27/02;29/68*

U.S. Cl. 257—301 **11 Claims**

1. A semiconductor memory device comprising a plurality of memory cells, each comprising:

a MOSFET element region including a source region, and a drain region, and a gate, the source region and the drain region being of a first conductivity type and formed in a surface of a substrate of a second conductivity type at positions aligned with a longitudinal centerline of the element region that is parallel to a centerline of a bit line, the gate being formed between the source region and the drain region;



a trench having an inside wall and formed in the substrate at a position centered in deviated relation to the longitudinal centerline of the element region; and

a capacitor including a storage node electrode, a capacitor insulator film, and a plate electrode, the storage node electrode being formed on an insulation film provided on the inside wall of the trench and in contact with the source region or the drain region through a storage node contact formed in the insulation film, the capacitor insulator film and the plate electrode being successively laminated on the storage node electrode.

5,488,243

SOI MOSFET WITH FLOATING GATE

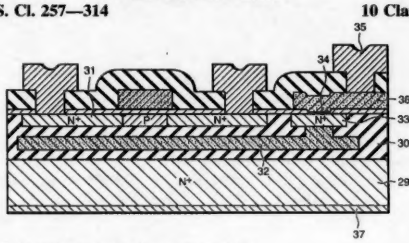
Kazuhiro Tsuruta, Obu; Hiroaki Himi, Nagoya; Akiyoshi Asai, Aichi, and Seiji Fujino, Toyota, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 3, 1993, Ser. No. 160,885

Claims priority, application Japan, Dec. 4, 1992, 4-325783; Jun. 2, 1993, 5-131864

Int. Cl.[6] H01L *29/78*

U.S. Cl. 257—314 **10 Claims**



1. A semiconductor device comprising

a semiconductor substrate,

a thin film single-crystalline semiconductor layer with an insulating layer interposed therebetween, the insulating layer containing a floating electroconductive layer buried therein,

a MOSFET comprising source and drain regions in the thin film single-crystalline semiconductor layer,

a gate insulating film on the thin film single-crystalline semiconductor layer,

a polysilicon gate on the gate insulating film,

a second thin film single-crystalline semiconductor layer on the insulating layer and insulated from the MOSFET,

a tunnel insulating film on the second thin film single-crystalline semiconductor layer,

a doped polysilicon layer on the tunnel insulating layer,

a second metal electrode layer on the doped polysilicon layer, and

a metal electrode layer connected to the semiconductor substrate acting as an electrode for applying a voltage to store electric charges in the floating electroconductive layer,

the thin film single-crystalline semiconductor layer having a channel region at a portion corresponding to the polysilicon gate,

the floating electroconductive layer being located at least at a position corresponding to the channel region of the MOSFET and being electrically insulated,

wherein the second thin film single-crystalline semiconductor layer is connected to the floating electroconductive layer, whereby the electric charge is introduced in the floating electroconductive layer by applying a voltage between the metal electrode layer and the second metal electrode layer so that electrons are injected from the doped polysilicon layer into the floating electroconductive layer through the tunnel insulating film.

5,488,244

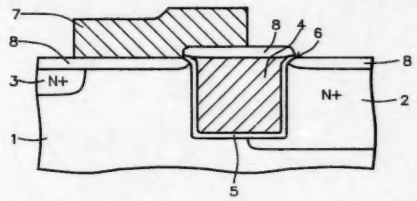
ELECTRICALLY ERASABLE AND PROGRAMMABLE READ ONLY MEMORY CELL

Elgin K. B. Quek, Singapore, Singapore; Brian E. Cronquist, San Jose, Calif., and Che C. Wei, Singapore, Singapore, assignors to Chartered SimiConductor Manufacturing PTE Ltd., Singapore

Filed Feb. 27, 1995, Ser. No. 394,786

Int. Cl.[6] H01L *29/76;21/265*

U.S. Cl. 257—314 **24 Claims**



1. An Electrically Erasable and Programmable Read Only Memory device, formed within a semiconductor body, comprising:

an N type source region;

an N type floating gate region, located adjacent to said source region, extending below the surface to approximately the same depth as said source region and partially overlapping it, but being electrically isolated from it by a layer of insulating material that surrounds the floating gate, and extending above the surface by an amount sufficient to allow its exposed rim to have the shape of a lip that overhangs the surrounding surface;

a layer of silicon nitride located between the surface of the semiconductor body and the underside of said overhanging lip;

an N type drain region adjacent to, but not overlapping, said floating gate and located on that side of said floating gate that does not overlap said source region; and

a control gate located above, and overlapping, both said drain region and said floating gate but separated from them by a layer of insulating material.

5,488,245

SEMICONDUCTOR MEMORY DEVICE CAPABLE OF ELECTRICALLY ERASING AND WRITING INFORMATION

Masahiro Shimizu; Masayoshi Shirahata; Takashi Kuroi, and Takehisa Yamaguchi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 126,160, Sep. 24, 1993, abandoned. This application Oct. 5, 1994, Ser. No. 318,482

Claims priority, application Japan, Mar. 19, 1993, 5-060369; Apr. 23, 1993, 5-097852

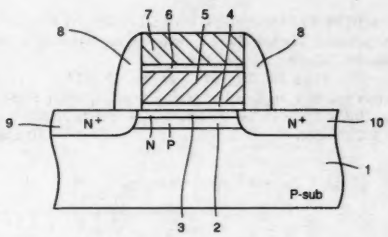
Int. Cl.[6] H01L *29/788*

U.S. Cl. 257—316 **16 Claims**

1. A semiconductor device comprising:

a semiconductor substrate of a first conductivity type having a main surface; and

a memory cell transistor formed on said main surface and comprising:



first and second source/drain regions of a second conductivity type formed on said main surface on opposite sides of a channel region;

a charge storage electrode located on the channel region with a first dielectric layer therebetween;

a control gate electrode located on said charge storage electrode with a second dielectric layer therebetween, wherein at least one of said first and second source/drain regions does not overlap said charge storage electrode and said control gate electrode; and

a first impurity region of the second conductivity type formed on said main surface in said channel region.

5,488,246

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

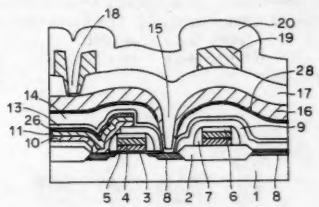
Yoshio Hayashide, and Kouichirou Tsujita, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1994, Ser. No. 229,273

Claims priority, application Japan, Apr. 16, 1993, 5-089770; Apr. 8, 1994, 6-070467

Int. Cl.[6] H01L *27/12*

U.S. Cl. 257—336 **6 Claims**



1. A semiconductor device, comprising:

a semiconductor substrate on a main surface of which an element isolating region and an active region are formed;

a MOS field effect transistor formed on said active region and having a pair of impurity diffused layers;

a conductive layer electrically connected to one of said pair of impurity diffused layers;

a first anti-reflection film formed of plasma silicon nitride film including more silicon than a stoichiometrical silicon nitride (Si_3N_4) formed on said conductive layer;

an interlayer insulating film having a contact hole reaching the other one of said pair of impurity diffused layers and covering said first anti-reflection film and said MOS field effect transistor;

a second anti-reflection film formed of a plasma silicon nitride film including more silicon than the stoichiometrical silicon nitride (Si_3N_4) formed on said interlayer insulating film; and

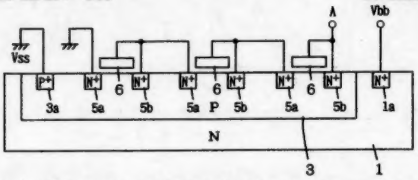
an interconnection layer electrically connected to the other one of said pair of impurity diffused layers formed on said second anti-reflection film.

5,488,247

MOS-TYPE SEMICONDUCTOR CLAMPING CIRCUIT

Mikio Sakurai, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 20, 1994, Ser. No. 277,817
Claims priority, application Japan, Sep. 21, 1993, 5-234554
Int. Cl.[6] H01L *29/78;* H02B *1/24;* H01H *35/00*
U.S. Cl. 257—368 10 Claims



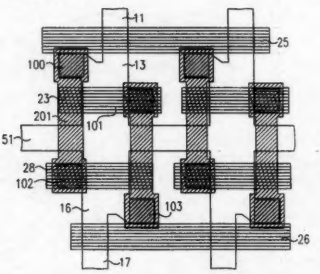
1. A MOS-type semiconductor clamping circuit, comprising:
a semiconductor substrate receiving a substrate potential;
at least one well of first conductivity type formed in said semiconductor substrate and isolated electrically from said substrate potential; and
a plurality of MOS-type transistors each having a source and a drain of second conductivity type formed in said well,
each of said plurality of transistors having its gate connected to its drain, those transistors being connected in series with each other, and a stable potential, different from said substrate potential, being applied to said well, providing a constant backgate potential for each of said plurality of MOS-type transistors.

5,488,248

MEMORY INTEGRATED CIRCUIT

Kuo-Hua Lee, and Janmye Sung, both of Lower Macungie Township, Lehigh County, Pa., assignors to AT&T Corp., Murray Hill, N.J.

Continuation of Ser. No. 358,664, Dec. 19, 1994, abandoned, which is a continuation of Ser. No. 178,598, Jan. 7, 1994, abandoned, which is a continuation of Ser. No. 997,152, Dec. 24, 1992, abandoned, which is a continuation of Ser. No. 813,188, Dec. 30, 1991, abandoned. This application May 19, 1995, Ser. No. 446,091
Int. Cl.[6] H01L *27/085;27/11*
U.S. Cl. 257—38.2 3 Claims



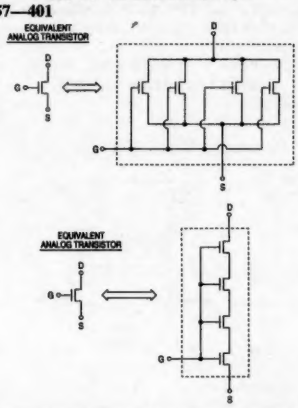
1. An SRAM semiconductor integrated circuit comprising:
a substrate having a doped region, said region having first and second electrically connected portions;
first and second gates overlying a substrate, said first gate having a first width and said second gate having a second width, both said first and second gate having their entire respective widths extending in the same direction, said gates defining between them a current path through said first portion of said substrate and not defining between them a current path through said second portion of said substrate;
a silicide covering said second portion of said substrate; a dielectric overlying said substrate and said gates, said dielectric having an opening exposing said silicide; and a resistive load material extending through said opening and directly contacting said silicide.

5,488,249

DIFFERENTIAL ANALOG TRANSISTORS CONSTRUCTED FROM DIGITAL TRANSISTORS

Harold S. Crafts, Colorado Springs, Colo., assignor to AT&T Global Information Solutions Company, Dayton, Ohio; Hyundai Electronics America, Milpitas, Calif., and Symbios Logic Inc., Fort Collins, Colo.

Continuation of Ser. No. 996,534, Dec. 24, 1992, abandoned. This application May 6, 1994, Ser. No. 239,166
Int. Cl.[6] H01L *27/105;27/085*
U.S. Cl. 257—401 6 Claims



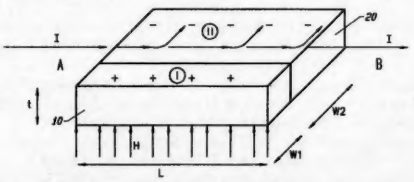
1. An integrated circuit comprising: two groups of digital transistors, having channel lengths not exceeding about 1.5 microns, connected together to form two compound transistors, and physically arranged on said integrated circuit such that the members of each group are symmetrical about respective centroids, wherein at least one of said two compound transistors comprises a plurality of FET devices serially connected together, such that a source of one of the plurality of FET devices is coupled to a drain of another of the plurality of FET devices.

5,488,250

HALL EFFECT MODULATION OF RESISTOR VALUES

Falke Hennig, 10149 Adriana Ave., Cupertino, Calif. 95014, assignor to Falke Hennig, Cupertino, Calif.

Filed Jun. 1, 1994, Ser. No. 252,479
Int. Cl.[6] H01L *29/82;43/04;43/08;* G11C *11/18*
U.S. Cl. 257—421 15 Claims



1. Apparatus including a structure comprising:
a first region of silicon material having a selected electron mobility;
a second region of silicon material having a different electron mobility than the first region of silicon material, the second region of silicon material being disposed adjacent the first region along a boundary region and in direct contact with the second region of silicon material;

means for applying a magnetic field to both the first the second regions of silicon material in a direction perpendicular to the boundary region to thereby create a Hall voltage across the boundary region and modify the resistance of the first and second regions of silicon material; and

means for detecting the change in resistance caused by the magnetic field.

5,488,251

SEMICONDUCTOR DEVICE AND PROCESS FOR PRODUCING THE SAME

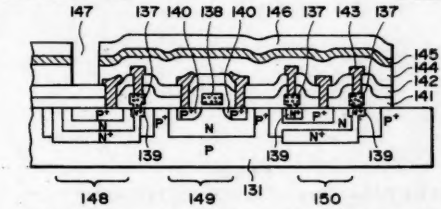
Hidemasa Mizutani, Sagamihara, and Shigeki Kondo, Hiratsuka, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 150,247, Nov. 9, 1993, abandoned, which is a continuation of Ser. No. 824,573, Jan. 23, 1992, abandoned, which is a division of Ser. No. 501,968, Mar. 29, 1990, Pat. No. 5,106,765, which is a continuation of Ser. No. 358,515, May 30, 1989, abandoned, which is a continuation of Ser. No. 240,485, Sep. 6, 1988, abandoned, which is a continuation of Ser. No. 18,457, Feb. 25, 1987, abandoned. This application Aug. 3, 1994, Ser. No. 285,765

Claims priority, application Japan, Feb. 28, 1986, 61-044790; Feb. 28, 1986, 61-044791

Int. Cl.[6] H01L *27/14;27/02*

U.S. Cl. 257—557 **8 Claims**



1. A photosensor comprising, in a semiconductor substrate of a first conductivity type, a photodiode composed of a semiconductor domain of a conductivity type opposite of the first conductivity type, all of a lower surface and sides of said photodiode being surrounded by a semiconductor domain of the conductivity type opposite of the first conductivity type and of a high impurity concentration, and a semiconductor domain of the first conductivity type forming a junction with said semiconductor domain of the conductivity type opposite of the first conductivity type, wherein said photodiode is separated from other semiconductor elements by a separating domain composed of a semiconductor of the first conductivity type,

wherein said other semiconductor elements include a transistor adjacent to said photodiode, with said transistor comprising a buried region and a diffusion region extending from a surface of said substrate to the buried region, and the diffusion region being arranged at one side of a base region, with said photodiode being arranged at the opposite side of said base region.

5,488,252

LAYOUT FOR RADIO FREQUENCY POWER TRANSISTORS

Ted Johansson, Hagersten, Sweden; Larry Leighton, Santa Cruz, Calif., and Ivar Hamberg, Stockholm, Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

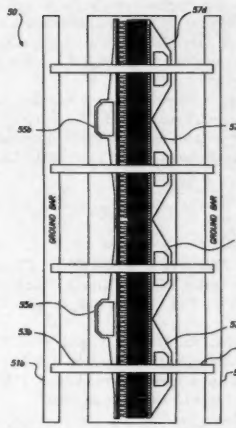
Filed Aug. 16, 1994, Ser. No. 291,427

Int. Cl.[6] H01L *27/095;23/58*

U.S. Cl. 257—579 **8 Claims**

1. An RF power transistor comprising:

a silicon die;



a pair of interdigitated electrodes formed on the silicon die, each electrode having a multiplicity of parallel electrode fingers and each including at least one bond pad;

regions of a first type of diffusion formed beneath electrode fingers of one electrode of the pair of interdigitated electrodes, and regions of a second type of diffusion formed beneath electrode fingers of another electrode of the pair of interdigitated electrodes;

a first wire connected to a bond pad of said one electrode and extending in a direction predominantly parallel to the electrode fingers of the one electrode;

and a second wire connected to a bond pad of said another electrode and extending in a direction predominantly parallel to the electrode fingers of said another electrode;

wherein the silicon die is substantially rectangular and has a least dimension in a direction substantially parallel to the electrode fingers of the pair of interdigitated electrodes, and wherein at least one of the pair interdigitated electrodes includes a plurality of bonds pads, the apparatus further comprising at least one additional wire such that one wire is connected to each of said bond pads of each electrode.

5,488,253

SEMICONDUCTOR DEVICE

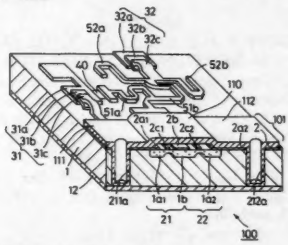
Hiroshi Matsuoka, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 4, 1994, Ser. No. 336,059

Claims priority, application Japan, Nov. 10, 1993, 5-280765

Int. Cl.[6] H01L *29/06;23/48;23/52;29/40*

U.S. Cl. 257—622 **5 Claims**



1. A semiconductor device including:

a semiconductor substrate having opposite front and rear surfaces;

a plurality of lower electrodes disposed on the front surface of the substrate and a rear electrode disposed on the rear surface of the substrate;

an air-bridge wiring disposed on the front surface of the substrate connecting two of the lower electrodes;

a via-hole penetrating through the semiconductor substrate proximate the two lower electrodes connected by the air-bridge wiring; and

a via-hole wiring disposed in the via-hole and connecting the two lower electrodes connected by the air-bridge wiring to the rear electrode wherein the air-bridge wiring and the via-hole wiring are a continuous, unitary electroplated metal film.

5,488,254

PLASTIC-MOLDED-TYPE SEMICONDUCTOR DEVICE

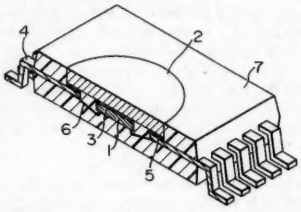
Asao Nishimura, Ushiku; Makoto Kitano, Tsuchiura, and Ichio Shimizu, Gunma, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 924,449, Aug. 4, 1992. This application Mar. 29, 1994, Ser. No. 219,742

Claims priority, application Japan, Aug. 5, 1991, 3-195505

Int. Cl.[6] H01L *23/48;23/02*

U.S. Cl. 257—707 **21 Claims**



1. A plastic-molded-type semiconductor device of a resin sealing type comprising:

a heat conductive member for heat radiation thermally connected to a semiconductor chip, the thermal connection being effected by securely fixing a surface corresponding to one main side of the chip directly to a surface of a side of said heat conductive member facing said one main side of the chip; and

a resin for encapsulating the whole chip and the entirety of or part of side surfaces of said heat conductive member while a surface at a side of said heat conductive member opposite the side thereof securely fixed to the chip being exposed,

wherein a portion of said heat conductive member which is encapsulated with said resin has a cross-section, substantially in parallel to said one main side of the chip, whose configuration is a polygon in which all corner portions thereof form internal angles of less than 180 degrees and which are dull angles.

5,488,255

COOLING DEVICE FOR SEMICONDUCTOR PACKAGES, HAVING FLEXIBLE FILM HEAT EXPULSION MEANS

Kazuo Sato, Tokyo; Mitsuhiro Shikida, Tsuchiura; Shigeo Ohashi, Tsuchiura; Toshio Hatada, Tsuchiura; Noriyuki Ashiwake, Tsuchiura; Shinji Tanaka, Ushiku; Takeshi Harada, Abiko, and Yukio Honda, Fuchu, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 7, 1993, Ser. No. 162,265

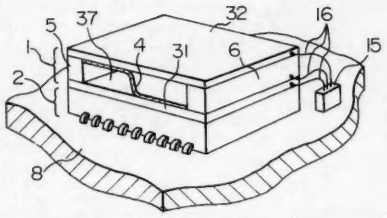
Claims priority, application Japan, Dec. 7, 1992, 4-326422; Feb. 17, 1993, 5-027763

Int. Cl.[6] H01L *23/34*

U.S. Cl. 257—718 **10 Claims**

1. A semiconductor package, comprising:

a substrate, on which a semiconductor chip including an electronic circuit is mounted, having an I/O portion for inputting and outputting electric signals to and from said semiconductor chip; and



a heat dissipation part which is disposed on said substrate to expel heat generated from said semiconductor chip, said heat dissipation part being a cooling device,

said cooling device, comprising:

a pair of flat plates which face each other with a gap therebetween, either of said flat plates being connected to a heat generating member,

a pair of side plates which are disposed on both ends of said flat plates and are connected so as to define a space between said pair of flat plates, and

a flexible film disposed within said space, both ends of said flexible film being fastened near different side plates on opposite ones of said flat plates so that the shape of said flexible film is changeable within said space to expel heat from within said space.

5,488,256

SEMICONDUCTOR DEVICE WITH INTERCONNECT SUBSTRATES

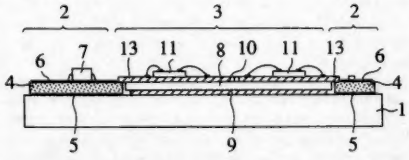
Tetsujiro Tsunoda, Fujisawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 2, 1994, Ser. No. 299,964

Claims priority, application Japan, Sep. 3, 1993, 5-219580

Int. Cl.[6] H01L *23/48;29/44;29/52;29/60*

U.S. Cl. 257—723 **5 Claims**



1. A semiconductor device comprising:

(a) a first insulating interconnect substrate for packaging power semiconductor elements;

(b) a second insulating interconnect substrate for packaging control elements for controlling the power semiconductor elements; and

(c) a metal base for supporting said first and second insulating interconnect substrates, wherein:

the top surfaces of said first and second insulating interconnect substrate are provided each with a conductive wiring pattern, the conductive wiring patterns on said first and second interconnect substrates are electrically connected to each other through extensions protruding from the wiring pattern of one of said first and second interconnect substrates and said extensions are part of the wiring pattern and formed as one body.

5,488,257

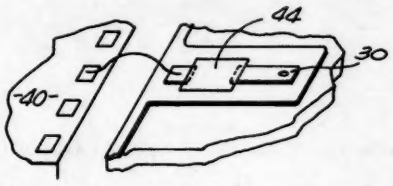
MULTILAYER MOLDED PLASTIC PACKAGE USING MESIC TECHNOLOGY

Bidyut Bhattacharyya, and Debendra Mallik, both of Chandler, Ariz., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 108,766, Aug. 18, 1993, abandoned, which is a continuation of Ser. No. 837,285, Feb. 18, 1992, abandoned. This application Feb. 6, 1995, Ser. No. 384,629

Int. Cl.[6] H01L *23/48;29/44;29/52*

U.S. Cl. 257—774 **10 Claims**



1. An integrated circuit package that houses an integrated circuit, comprising:

a conductive plate;

a first insulative layer that is adjacent to said conductive plate;

a first conductive layer that is adjacent to said first insulative layer;

a lead frame having a plurality of conductive leads;

a layer of polyimide located between said first conductive layer and said lead frame;

a via that extends through said lead frame and said polyimide layer said via containing an electrically conductive material which electrically connects said lead frame to said first conductive layer;

a passive element located on said first insulative layer and coupled to said first conductive layer; and,

first connector means for electrically coupling said conductive plate with said lead frame.

5,488,258

CIRCUIT FOR MUTING NOISES IN A POWER AMPLIFIER

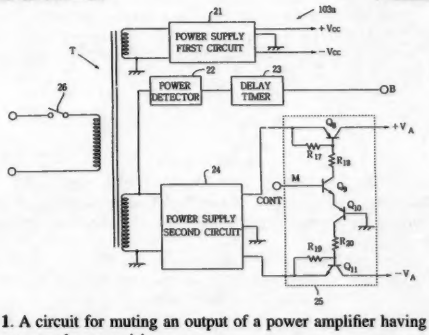
Jun Honda, Tokyo, Japan, assignor to Pioneer Electric Corporation, Tokyo, Japan

Filed Mar. 3, 1994, Ser. No. 205,257

Claims priority, application Japan, Mar. 5, 1993, 5-045569

Int. Cl.[6] H03F *1/26*

U.S. Cl. 307—64 **7 Claims**



1. A circuit for muting an output of a power amplifier having a power supply, comprising:

a power switch provided in an input side of the power supply for turning on the power supply;

power detector means for detecting closing of the power switch and for producing a power-on signal after a predetermined time from detection of the closing of the power switch;

abnormality detector means for detecting an abnormal voltage produced in a circuit of the power amplifier and for producing an abnormality signal when detected;

a power control circuit responsive to the power-on signal for activating at least an output stage of the power amplifier after the predetermined time, and for cutting off the output stage in response to the abnormality signal.

5,488,259

MOTOR MOUNT FOR AN ELECTRICAL MOTOR

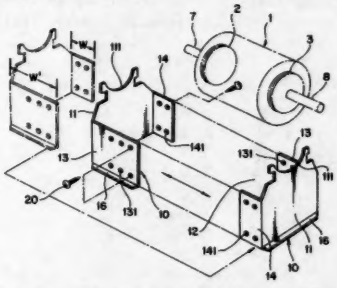
Nam-Sik Cho, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 4, 1994, Ser. No. 334,077

Claims priority, application Rep. of Korea, Dec. 11, 1993, 93-23770

Int. Cl.[6] H02K *15/14*

U.S. Cl. 310—91 **7 Claims**



1. A motor mount for supporting a motor, comprising a pair of support members each having a contact face for supporting a portion of a motor; said support members being movable relative to one another to adjust a distance between said contact faces to adapt the motor mount to different-size motors; and fastening means for holding said support members in their adjusted positions; each support member comprising an upright wall having opposite sides thereof bent to a parallel relationship such that each upright wall includes an upright support portion, and two upright parallel side portions extending from said support portion; said support portion defining said contact face; said pair of support members being of identical construction to one another.

5,488,260

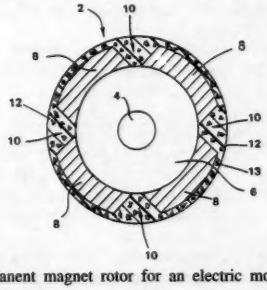
ENCAPSULATED MAGNETS IN A PERMANENT MAGNET ROTOR

Marc A. Heyraud, La Chaux de Fonds, Switzerland, assignor to Johnson Electric S.A., Switzerland

Filed Oct. 15, 1993, Ser. No. 138,249

Int. Cl.[6] H02K *21/12*

U.S. Cl. 310—156 **12 Claims**



1. A permanent magnet rotor for an electric motor, the rotor comprising:

a cylindrical rotor base;

a plurality of permanent magnets located circumferentially around said rotor base with a respective circumferential gap located between adjacent permanent magnets;

a binder located in each of said gaps and having a magnetic material dispersed therein, said magnetic material in each said circumferential gap being magnetized with a radial magnetic flux which varies circumferentially across said gap.

5,488,261

CARBON BRUSH AND FASTENING A BRAIDED INDICATOR WIRE THEREIN

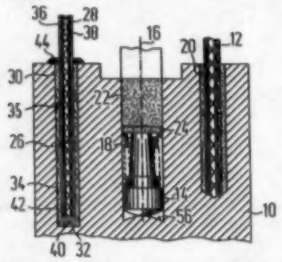
Anton Swoboda; Edmund Kubler, both of Vienna, Austria; Horst Ulm, Huttenberg, and Gunter Schardt, Giessen-Klein-Linden, both of, Germany, assignors to Schunk Kohlenstofftechnik GmbH, Heuchelheim, Germany

Filed May 11, 1994, Ser. No. 241,363

Claims priority, application Germany, May 11, 1993, 43 15 622.3

Int. Cl.[6] H02K *13/00*

U.S. Cl. 310—249 **11 Claims**



1. A carbon brush (**10**) extending in a longitudinal direction (**16**) from a contact surface with an indicator wire (**28**) for indicating a predetermined amount of wear of the carbon brush, a recess (**30**) is formed in the carbon brush, a portion (**26**) of the indicator wire is embedded in the recess which is in the form of a blind bore extending in the longitudinal direction of the carbon brush,

said indicator wire comprising a braided conductive core (**36**) surrounded by an insulating sheath (**38**) and having a free conductive end (**42**),

said portion (**26**) being spaced apart from flat bottom (**32**) of the recess, and insulating material disposed on the bottom,

said insulating material forming an inherently rigid insulating layer (**40**) covering the bottom.

5,488,262

SPARK ELECTRODE HAVING LOW THERMAL STRESS

Kozo Takamura, Nagoya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 11, 1992, Ser. No. 987,951

Claims priority, application Japan, Dec. 13, 1991, 3-330630

Int. Cl.[6] H01T *13/20*

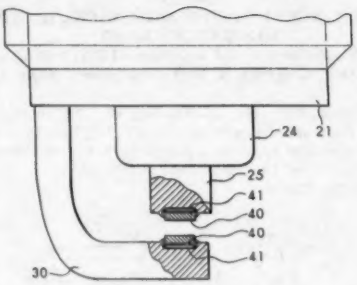
U.S. Cl. 313—141 **23 Claims**

1. A spark electrode comprising:

a base metal having at least a portion thereof proximate a spark gap;

a thermal stress relieving layer for reducing thermal stress welded to said base metal at said portion proximate said spark gap; and

a corrosion resistant discharge layer bonded to a side of said thermal stress relieving layer opposite said base metal and including portions surrounding at least a portion of peripheral edges of said thermal stress relieving layer.



5,488,263

COLOR SELECTING ELECTRODE FOR CATHODE-RAY TUBE

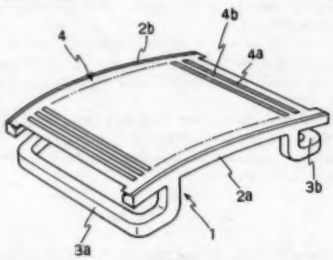
Taketoshi Takemura; Makoto Sakuwa, and Haruo Watanuki, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, and Sony Corporation, both of Tokyo, Japan

Filed Jun. 23, 1994, Ser. No. 264,293

Claims priority, application Japan, Feb. 17, 1994, 6-020277

Int. Cl.[6] H01J *29/80*

U.S. Cl. 313—402 **6 Claims**



1. A color selecting electrode for use in a cathode-ray tube, comprising a frame having a pair of opposed first supports and a pair of opposed second supports extending in a direction such as to cross the pair of first supports, and grid elements arranged on the pair of first supports at a fixed pitch and stretchedly bridging the pair of first supports,

wherein the pair of second supports and the grid elements are, respectively, made of materials selected such that a mean coefficient of thermal expansion in a temperature range from 0° C. to 470° C. of the pair of second supports is not greater than 85% of that of the grid elements over the same temperature range.

5,488,264

ELECTRON GUN FOR COLOR CATHODE-RAY TUBE

Yutaka Ota; Yukinobu Iguchi, and Yoshifumi Nakayama, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 24, 1993, Ser. No. 80,776

Claims priority, application Japan, Jun. 29, 1992, 4-170321

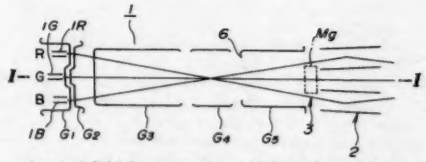
Int. Cl.[6] H01J *29/51*

U.S. Cl. 313—412 **7 Claims**

1. An electron gun for a color cathode-ray tube, comprising:

first, second and third cathodes arranged horizontally parallel with each other, each of said cathodes emitting an electron beam modulated by a signal;

a plurality of axially aligned electrodes, each of which is supplied with a predetermined voltage, forming a predetermined



electrical field for converging said three electron beams to a converging spot and then diverging said three beams;

a convergence plate member for converging said diverged three beams;

quadruple magnetic field generating means arranged between said electrodes and said convergence plate member for effecting an astigmatic lens action to a center beam of said three beams without substantially effecting side beams of said three beams; and

astigmatic canceling means arranged at or near said converging spot along said electrodes for canceling astigmatism imparted to said side beams of said three beams by said electrical field.

5,488,265

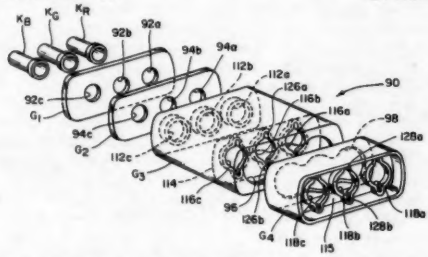
ELECTRON GUN WITH CHAIN-LINK MAIN LENS FOR STATIC CORRECTION OF ELECTRON BEAM ASTIGMATISM

Hsing-Yao Chen, Barrington, Ill., assignor to Chunghwa Picture Tubes, Ltd., Taoyuan, Taiwan, Prov. of China

Continuation of Ser. No. 140,311, Oct. 22, 1993, abandoned. This application Aug. 7, 1995, Ser. No. 511,722

Int. Cl.[6] H01J *29/50*

U.S. Cl. 313—414 **20 Claims**



1. An electrode in an electron gun for directing a center and two outer inline electron beams along respective parallel axes onto a display screen of a color cathode ray tube (CRT) in forming a video image on said screen, said electrode comprising:

a hollow housing open at a first end and including means disposed on a second, opposed end thereof for defining three inline end apertures at a second opposed end and a thin lateral wall forming side portions of said housing, wherein each of said inline end apertures is aligned with a respective one of said axes for passing a respective one of said beams and wherein said first open end includes a single common aperture having a longitudinal axis aligned generally transverse to said inline electron beams for passing said center and two outer electron beams;

wall means disposed in said hollow housing for defining circular portions of three inline auxiliary apertures disposed intermediate said first and second ends of said housing, wherein each of said auxiliary apertures is aligned with a respective one of said axes for passing a respective one of said beams and wherein said circular portions of each of said auxiliary apertures are adapted to receive in tight-fitting engagement an elongated support rod having a generally circular cross section for aligning the electrode during electron gun assembly, and wherein said wall means and said first and second ends of said hollow housing are maintained at the same fixed voltage; and

an upper and lower pair of slots disposed in each of said auxiliary apertures and aligned generally transverse to said longitudinal axis for providing a static correction for electron beam astigmatism, wherein said static correction is of substantially fixed magnitude over the entire display screen.

5,488,266

ELECTRO-LUMINESCENCE DEVICE

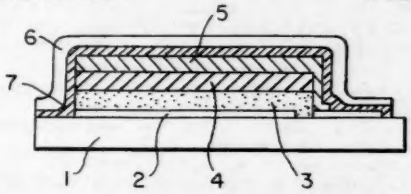
Masaaki Aoki; Isao Yokotsuka, both of Tokyo, and Yoshihiro Ogata, Yamagata, all of, Japan, assignors to Showa Shell Sekiyu K. K., Tokyo, Japan

Filed Dec. 28, 1993, Ser. No. 174,254

Claims priority, application Japan, Dec. 28, 1992, 4-347584

Int. Cl.[6] H01J *1/64*

U.S. Cl. 313—509 **9 Claims**



1. An electro-luminescence device comprising a laminate composed of a transparent substrate having successively laminated thereon a transparent electrode, a luminous layer, a dielectric layer, and a back electrode, with a back protective material being adhered to the back electrode through an adhesive resin film, wherein the back protective material is a moisture impermeable protective material and the adhesive resin film is a thermoplastic resin film having a thickness of from 10 to 200 μm.

5,488,267

XENON LAMP SYSTEM FOR MATERIALS TESTING APPARATUS

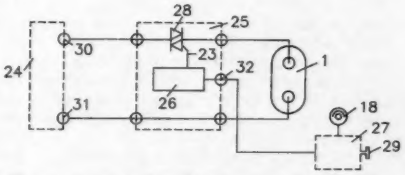
Bernd Rudolph, Alzenau; Klaus J. Dietz, Wiesbaden, and Klaas Oostlander, Hanau, all of, Germany, assignors to Heraeus Xenotest GmbH, Hanau, Germany

Filed Jul. 26, 1994, Ser. No. 280,311

Claims priority, application Germany, Aug. 2, 1993, 43 25 718.6

Int. Cl.[6] H01J *7/44*

U.S. Cl. 315—63 **9 Claims**



1. In and for combination with a test instrument which tests materials with respect to weathering and fading when exposed to light,

an illumination system for said weathering and fading resistance test instrument comprising

means for generating said light with a predetermined ratio of ultraviolet (UV) to infrared (IR) radiation,

said light generating means including

a xenon gas discharge lamp (1) having an elongated lamp bulb (2) that has one electrode (4) at each of its two ends, between which electrodes (4) an arc discharge forms, and a fill including Xenon within said bulb (2) and

an electronic control unit (**25**) that has a controllable switch (**28**), connected to and applying pulses of current across said electrodes (**4**), thereby creating said arc discharge,

wherein

the spacing of said electrodes (**4**) in the lamp defines an arc length which is in the range from 10 to 50 cm; the inside diameter of the bulb (**2**) is in the range from 5 to 15 mm at said range of the arc length;

the cold fill pressure of said xenon inside said bulb (**2**) is less than 400 mbar;

the duty factor of the pulses provided by said control unit (**25**) is in a range from 1:1 to 1:100; and

the amplitude values of the discharge current of the pulses are in the range between 15 and 100 A.

5,488,268

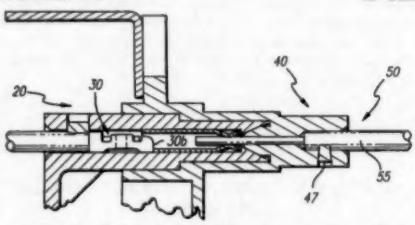
ELECTRICAL CONNECTOR WITH IMPROVED CENTERING OF MATING TERMINAL PINS, FOR A FLUORESCENT-LIGHTING BALLAST

Fred P. Bauer, Mendenhall; Stuart E. Sanders, Brandon, both of Miss.; Raymond H. Van Wagener, Darien, Conn., and Mark R. Opperthauser, Jackson, Miss., assignors to Magnetek, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 9,645, May 14, 1993, Pat. No. 5,350,316, and a continuation-in-part of Ser. No. 680,699, Apr. 4, 1991, Pat. No. 5,260,678. This application Apr. 8, 1994, Ser. No. 224,811

Int. Cl.[6] H01J *7/44*

U.S. Cl. 315—70 **29 Claims**



1. In combination, a ballast and connecting apparatus for use in a fluorescent-lamp fixture having lamp sockets; said combination comprising:

at least one electrical winding mounted within the ballast;

two pluralities of electrical leads within the fluorescent-lamp fixture:

one plurality of electrical leads within the ballast and operatively connected to the winding, for carrying electrical power to and from the winding, and

another plurality of electrical leads extending through such fixture substantially outside the ballast, at least some of these leads being operatively connected with lamp sockets of such fixture for carrying electrical power to the sockets;

two mutually matable electrical half-connectors, one for terminating said one plurality of leads and another for terminating said other plurality of leads;

a plurality of individual electrical male contacts, formed from or operatively connected to one of the two pluralities of electrical leads respectively, and fixed within a first of the two half-connectors;

a plurality of individual electrical female contacts, operatively connected to the other of the two pluralities of electrical leads respectively, and fixed within a second of the two half-connectors;

a plurality of through-holes defined within the second half-connector, each said through-hole holding a respective one of the female contacts, and each through-hole having:

a rearward end for receiving insertion of one female contact,

a forward end for receiving insertion of a part of one male contact, extending from the first half-connector, into the female contact to complete connections from the ballast winding to the lamp sockets,

a necked-down section, forward from a forward tip of the female contact in that hole, and

a preformed bore whose transverse preformed dimensions along the entire length of the bore rearward from the necked-down forward section are at least as great as its transverse dimensions immediately rearward from the necked-down forward section; and

means for retaining each female contact in its respective bore.

5,488,269

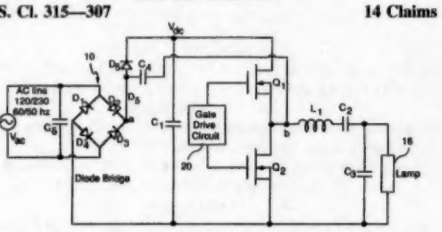
MULTI-RESONANT BOOST HIGH POWER FACTOR CIRCUIT

Sayed-Amr El-Hamamsy; Mustansir H. Kheraluwala, both of Schenectady, N.Y., and David J. Kachmarik, North Olmsted, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 10, 1995, Ser. No. 386,572

Int. Cl.[6] G05F *1/00*

U.S. Cl. 315—307 **14 Claims**



1. A power factor correction circuit, comprising:

a rectifier for receiving an ac line current and supplying a dc bus voltage on a dc bus from an ac line voltage, said rectifier having an input and an output;

a high frequency filter coupled at the input of said rectifier, said high frequency filter comprising a filter capacitance;

a half-bridge converter for providing a voltage which pulsates between a reference potential and said dc bus voltage, said half-bridge converter comprising a pair of switching devices connected in series with a junction therebetween;

a one-way electrical valve connected between the output of said rectifier and said dc bus for allowing current flow from said rectifier to said dc bus;

an energy storage capacitance coupled between said dc bus and said reference potential;

a capacitance coupled between the output of said rectifier and the junction between said switching devices;

a resonant load circuit connected to the junction between said switching devices, said resonant load circuit comprising a resonant inductance, a resonant capacitance and a load; and

a driver circuit for alternately switching said switching devices, said driver circuit comprising a dead time control circuit for selecting a predetermined dead time after one of said devices switches off and the other of said devices switches on.

5,488,270

COLOR CRT DISPLAY APPARATUS

Hidenori Takita, and Tatsuhiro Hirakawa, both of Nagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1994, Ser. No. 230,550

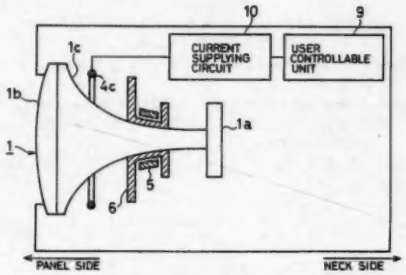
Claims priority, application Japan, Dec. 10, 1993, 5-310887

Int. Cl.[6] H01J *29/56*

U.S. Cl. 315—370 **10 Claims**

1. A color CRT display apparatus comprising:

a color CRT having an electron gun, a deflection yoke, and a display panel, for displaying, on said display panel, an image



created by electron beams emitted from said electron gun and deflected by said deflection yoke;

signal outputting means for outputting a signal to be used to compensate an external magnetic field in a tube axis direction, said signal having an amount and a direction;

a current supplying circuit for supplying a current proportional to the amount of said signal outputted from said signal outputting means and flowing in a direction corresponding to the direction of said signal; and

a compensating coil, disposed in a plane substantially perpendicular to said tube axis-direction, for generating a compensating magnetic field in response to the current from said current supplying circuit, said compensating coil being wound around a tunnel portion of the color CRT between said display panel and said deflection yoke at a position along said tube axis direction substantially closer to said display, panel than a first location at which a compensating magnetic field compensates primarily for raster rotation and substantially closer to said deflection yoke than a second location at which a compensating magnetic field compensates primarily for purity rotation.

5,488,271

DEFLECTION REGULATING METHOD AND DEVICE

Günter Gleim, Villingen, Germany, assignor to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Germany

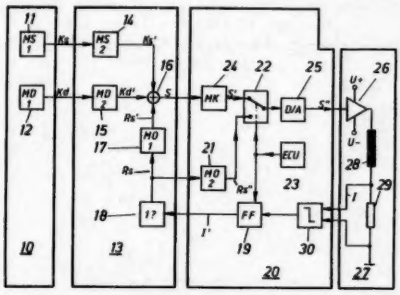
Continuation of Ser. No. 55,108, May 3, 1993, abandoned.

This application Apr. 14, 1995, Ser. No. 422,741

Claims priority, application Germany, May 4, 1992, 42 14 317.9

Int. Cl.[6] G09G *1/04;1/28;* **H04N** *3/22*

U.S. Cl. 315—370 **20 Claims**



1. A method of deflection current regulation in a deflection amplifier coupled to a deflection coil, comprising the steps of:

(a) measuring a deflection current value during a first mode of operation;

(b) comparing said measured value with a predetermined value to produce a first correction signal;

(c) applying said first correction signal to said deflection amplifier to provide corrective regulation during said first mode of operation;

(d) combining a predetermined correction signal, comprising a static error correction component and a dynamic error correction component with said first correction signal to produce a second correction signal; and,

(e) applying said second correction signal to said deflection amplifier to provide corrective regulation during a second mode of operation.

5,488,272

DEFLECTION SYSTEM

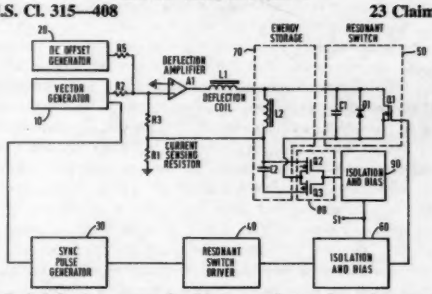
John R. Cotton, Nr. Sheffield, United Kingdom, assignor to Rank Brimar Limited, United Kingdom

Filed Feb. 9, 1993, Ser. No. 15,571

Claims priority, application United Kingdom, Feb. 12, 1992, 9202961; May 8, 1992, 9211341

Int. Cl.[6] H01J *29/70;29/76*

U.S. Cl. 315—408 **23 Claims**



1. A deflection system for driving an electron beam in a raster scan comprising:

a deflection coil;

a flyback capacitance arranged to resonate with the deflection coil;

means for switchably bypassing the flyback capacitance to prevent said resonance, and

means for energizing the deflection coil with a scanning signal;

the system being characterized in that it comprises scan shift means for shifting the raster scan comprising;

means for supplying a DC offset current through said coil; and

means for decoupling the DC offset current from the flyback capacitance during flyback,

whereby the resonance current produced during flyback is superimposed on the offset current so as to offset the scan and flyback positions on the CRT.

5,488,273

CEILING FAN AND LIGHT ASSEMBLY CONTROL METHOD AND THE CONTROL CIRCUIT THEREFOR

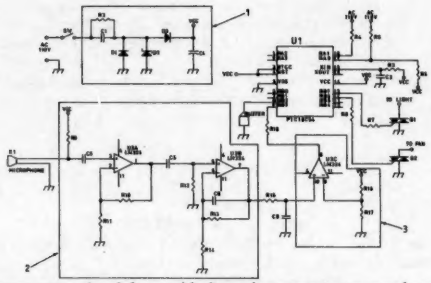
Chin-Hsiung Chang, No. 192, Shu Jen Rd., Ban Tan Chun, Wu Fong Hsiang, Taichung Hsien, Taiwan, Prov. of China

Filed Nov. 18, 1994, Ser. No. 341,117

Int. Cl.[6] H04Q *7/02;* **A63H** *30/04*

U.S. Cl. 318—16 **2 Claims**

1. A ceiling fan and light assembly control circuit comprising a direct current power supply circuit, an audio amplifier circuit, a microphone, a low pass filter circuit, a comparator, and a microprocessor; said direct current power supply circuit receiving alternating current power through a single-throw switch, converting said alternating current into low voltage direct current power when said single-throw switch is on and supplying said low voltage direct current power to said audio amplifier circuit, said comparator and said microprocessor; said direct current supply circuit containing a filter capacitor for supplying direct current to said microprocessor when said single-throw switch is turned off after said capacitor is charged; resisters arranged between said single-throw switch and inputs of said microprocessor for creating a



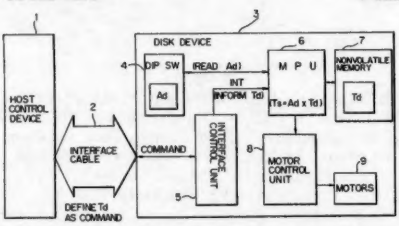
square wave signal from said alternating current power and supplying said square wave signal to said microprocessor only when said single-throw switch is on; said microphone connected to said audio amplifier circuit, and said low-pass filter connected in series between said audio amplifier circuit and said comparator for amplifying signals received by said microphone, filtering the amplified signals, comparing the filtered signals and producing pulse wave signals based thereon; said microprocessor having an input terminal connected to said comparator and receiving said pulse wave signals, an output terminal connected to a fan speed control circuit and a light intensity control circuit of a ceiling fan and light assembly and an internal program; said internal program monitoring said square wave signal and, when said square wave signal is interrupted by turning said single-throw switch off and on while said microprocessor receives power from said filter capacitor, changing fan speed or light intensity; said internal program also monitoring said pulse wave signals received from said comparator and changing fan speed or light intensity based on number of said pulse wave signals received and a time interval between said pulse wave signals.

5,488,274

METHOD FOR CONTROLLING ACTIVATION OF DISK DRIVE MOTORS

Masafumi Satoh, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 28, 1993, Ser. No. 98,704
Claims priority, application Japan, Jul. 28, 1992, 4-200810
Int. Cl.[6] H02P *1/54*; G05B *11/01*
U.S. Cl. 318—101 **6 Claims**



1. A method for controlling the activation of a plurality of disk devices, wherein each disk device has a motor, the method comprising the steps of:

determining a device number set value (A_d) determined exclusively for the disk device;

determining a motor activation start time delay (T_d) which is designated by a host control device;

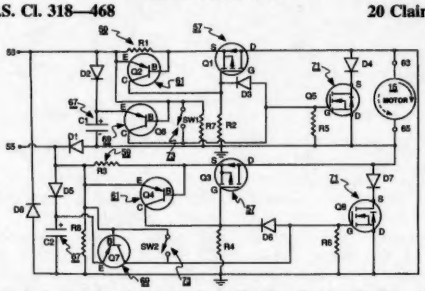
determining a motor activation start time (T_s) which corresponds to the device number set value (A_d) to thereby control activation of the motor, wherein the motor activation start time delay (T_d) is set in the form of a command in an interface between the disk device and the host control device.

5,488,275

CONTROL CIRCUIT FOR FEEDBACK, MOTOR-OPERATED VALVE

Bill Tice, Carlsbad, Calif., assignor to ETI Systems, Carlsbad, Calif.

Division of Ser. No. 177,062, Jan. 3, 1994, Pat. No. 5,461,290.
This application Mar. 16, 1995, Ser. No. 405,369
Int. Cl.[6] F16K *31/04*
U.S. Cl. 318—468 **20 Claims**



1. A control circuit for precisely limiting the travel of a valve driven by a reversible motor comprising:

a) voltage-regulated, current-passing means for passing current from a direct voltage source to the motor, said current-passing means having a default configuration such as to permit full current flow there-across when said voltage source is initially applied;

b) normally-open, voltage-actuated switch means interconnecting the motor to ground; and,

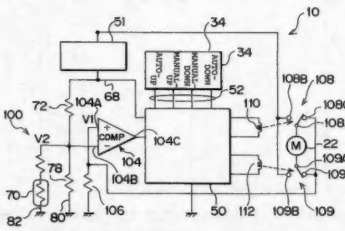
c) normally-open, physically-activated, limit-switch means interconnected the voltage source, said current-passing means and said voltage-actuated switch means that remains open during travel of the valve between limits physically established in said circuit so that, upon reaching one of said limits, said limit-switch means is closed to provide immediate voltage to turn off said current-passing means and to close said switch means to immediately drain all forward and reverse EMF to ground and stop rotation of the motor.

5,488,276

APPARATUS FOR DRIVING AND CONTROLLING MOTOR

Yasushi Nishibe, Niwa, Japan, assignor to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Dec. 21, 1993, Ser. No. 170,817
Claims priority, application Japan, Dec. 25, 1992, 4-346987
Int. Cl.[6] G05B *5/00*
U.S. Cl. 318—473 **9 Claims**



1. An apparatus for controlling a motor that moves a movable window portion of a vehicle, the apparatus comprising:

current detection means for detecting a value of current flowing through said motor when said motor is moving said movable portion;

control means for comparing the current value detected by said current detection means with a comparison current value, and

for controlling said motor based on the comparison of the detected current value with said comparison current value;

temperature sensing means for sensing a temperature of an environment of said movable portion; and

comparison current varying means for varying said comparison current value based on the temperature sensed by said temperature sensing means.

5,488,277

TRAVEL CONTROL METHOD, TRAVEL CONTROL DEVICE, AND MOBILE ROBOT FOR MOBILE ROBOT SYSTEMS

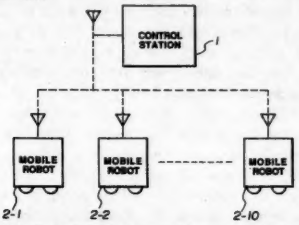
Yuji Nishikawa, and Masanori Onishi, both of Ise, Japan, assignors to Shinki Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 513,546, Apr. 24, 1990, Pat. No. 5,179,329. This application Jul. 8, 1992, Ser. No. 912,977

Claims priority, application Japan, Apr. 25, 1989, 1-105491; May 30, 1989, 1-137290; May 30, 1989, 1-137291; May 30, 1989, 1-137292; May 30, 1989, 1-137293; May 31, 1989, 1-138219; May 24, 1989, 1-130959; May 29, 1989, 1-134883; May 29, 1989, 1-134884; Jun. 20, 1989, 1-157838; Jun. 20, 1989, 1-157839

Int. Cl.[6] H02J *7/00;* **G05B** *1/00;* **G06F** *15/50*

U.S. Cl. 318—587 **1 Claim**



1. A mobile robot adapted to move along a travel path, said path having sections and having associated therewith a path indicia means, said robot including:

a first sensor for detecting and measuring distances to surfaces along said path;

a first memory means for storing data corresponding to distances from the travel path to said surfaces;

first means for controlling the travel of the mobile robot so that the distances measured by said first sensor agree with the data stored in said first memory means;

a second sensor for detecting said indicia means associated with the travel path;

a second means for controlling the travel of said mobile robot so that said second sensor moves along said indicia means according to the output of said second sensor;

a second memory means for storing data indicating which of said first and second travel controlling means is used for every section of the travel path; and

means for reading the data in said second memory means and activating the travel controlling means indicated by the data.

5,488,278

LOAD LIMIT SYSTEM FOR MECHANICAL LINEAR ACTUATOR

Peter S. McGraw, Severna Park, and Charles M. Kelly, Annapolis, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 23, 1994, Ser. No. 311,633

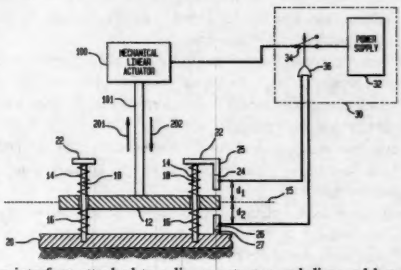
Int. Cl.[6] G05G *5/00*

U.S. Cl. 318—626 **8 Claims**

1. A load limit system for a linear actuator, comprising:

first spring means;

second spring means;



an interface attached to a linear actuator and disposed between said first spring means and said second spring means, said interface imparting a load force to one of said first spring means and said second spring means when said interface is moved in one of two opposing directions by said linear actuator; and

sensing means for sensing a first amount of linear compression of said first spring means when said interface imparts a load force to compress said first spring means, and for sensing a second amount of linear compression of said second spring means when said interface imparts a load force to compress said second spring means, wherein said interface ceases to impart a load force whenever one of said first amount of linear compression and said second amount of linear compression is sensed.

5,488,279

DUAL POWER REFRIGERATOR

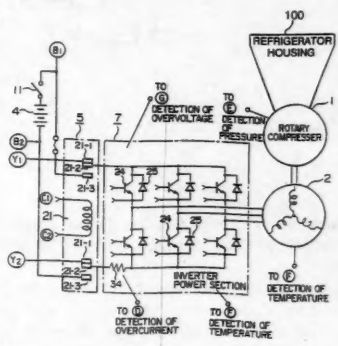
Takato Kawamoto; Makoto Gezima, and Elichi Furuse, all of Gunma, Japan, assignors to Sawafuji Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 812,710, Dec. 23, 1991, abandoned. This application Dec. 27, 1993, Ser. No. 174,164

Claims priority, application Japan, Dec. 28, 1990, 2-416906; Apr. 12, 1991, 3-79664

Int. Cl.[6] H02S *9/00;* **H02P** *1/00*

U.S. Cl. 318—801 **9 Claims**



1. A rotary-compressor control system for electric refrigerators having rotary compressors to cool the inside of the electric refrigerator, characterized in that said rotary-compressor control system comprises

a battery for supplying a battery voltage less than or equal to approximately 24 volts,

a switching power section having a rectifying section and an inverter section for rectifying commercial a-c power with said rectifying section, reducing a voltage of said commercial a-c power to a substantially same voltage of said battery in said inverter section,

an automatic changeover means for changing over from d-c voltage from said battery to d-c voltage from said switching power section and vice versa,

an inverter power section receiving d-c power supplied from said battery or said switching power section via said automatic changeover means and converting said d-c power into a three-phase a-c voltage,

a three-phase induction motor for driving said rotary compressor with said three-phase a-c voltage generated in said inverter power section;

control means for changing said automatic changeover means preferentially to the side of said switching power section when commercial a-c power is used, and producing a control signal for controlling said inverter power section on the basis of a pressure detection signal provided from the rotary compressor; said rotary compressor being driven by said three-phase induction motor operating with a motor voltage having a magnitude substantially similar to said battery voltage;

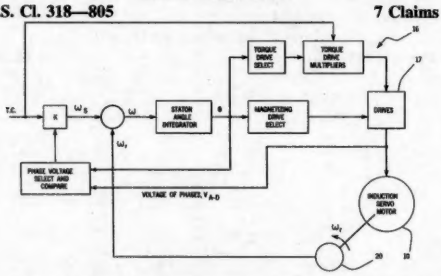
a delta-Y connection changing means for changing over a connection of said three-phase induction motor from a delta connection to a Y connection and vice versa, said changing means causing said three-phase induction motor to be driven in the delta connection when battery voltage is approximately 12 V, and in the Y connection when battery voltage is approximately 24 V.

5,488,280

ADAPTIVE CONTROL OF A MULTIPHASE INDUCTION MOTOR HAVING CONCENTRATED PHASE WINDINGS

Gerald K. Langreck, Phillips, Wis., assignor to Marquip, Inc., Phillips, Wis.

Filed Apr. 26, 1994, Ser. No. 233,119
Int. Cl.[6] H02P *5/40*
U.S. Cl. 318—805 **7 Claims**



1. A multiphase servomotor system for an induction motor having concentrated stator windings of more than three phases comprising:

means for directing commutated magnetizing current into selected stator phase windings to create a commutated magnetic field within a given peripheral portion of the air gap between the stator and a rotor operating therein;

means for directing commutated torque currents into the stator phase windings corresponding to the position of the commutated magnetic field;

means for non-invasively measuring variations in the magnetic field density over said given peripheral portion; and,

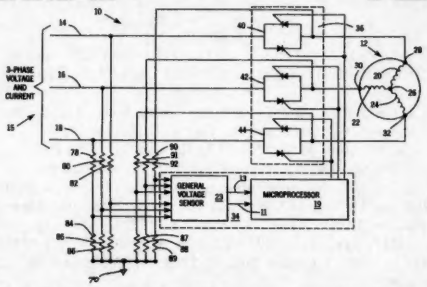
means for adjusting a slip speed between the commutated magnetic field and rotor speed in response to the magnetic field density measurements to maintain a uniform commutated magnetic field.

5,488,281

METHOD AND APPARATUS FOR PREDICTING WINDING FAILURE USING ZERO CROSSING TIMES

Peter J. Unsworth, Lewes, England, and Yuan Wang, Jiading, China, assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Sep. 28, 1994, Ser. No. 314,472
Int. Cl.[6] H02P *7/36*
U.S. Cl. 318—806 **23 Claims**



1. A method to be used with a motor controller, the motor controller providing stator winding currents at a frequency of X cycles per second and indicating zero crossing times when each current is zero, a set of ideal rotor signal data, an acceptable rotor error value, and a sampling period, the motor being of a design having p poles, the method predicting rotor winding failure, the method comprising the steps of:

generating a sequence of error signals over the sampling period, each error signal indicating the period between consecutive current zero crossings, the plurality of error signals together forming an error signal spectrum; analyzing the error signal spectrum to determine a signal amplitude of a rotor component within a region of interest, the region of interest being frequencies between K((2X/p)−n) and K(2X/p) Hz, where n is less than 2x/p and K is an integer;

determining a slip value indicating the difference in stator current frequency and the rotor frequency;

multiplying the signal amplitude by the slip value to produce a rotor signal; and

comparing the rotor signal to the ideal rotor signal data to produce a rotor error signal indicative of the degree of rotor failure.

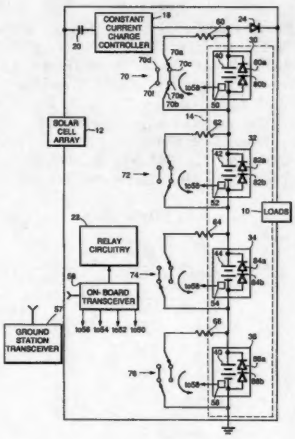
5,488,282

SYSTEM AND METHOD FOR RECONDITIONING SPACECRAFT BATTERY

Joseph H. Hayden, Rancho Palos Verdes, and Steven J. Stadnick, Lakewood, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 23, 1993, Ser. No. 81,503
Int. Cl.[6] H01M *10/44;* **H02J** *7/00*
U.S. Cl. 320—14 **9 Claims**

1. A battery reconditioning system for a spacecraft having a single battery serving as a secondary source of electrical energy to support spacecraft electrical loads, said battery including a plurality of serially connected packs each comprising a plurality of cells, the system comprising: sensor means for sensing the state of charge of each of said packs, reconditioning load means associated with each of said packs, battery charging means, switch means for connecting a reconditioning load means across its associated pack, switch control means responsive to the state of charge of said packs for controlling said switch means and said charging means to selectively and sequentially recondition each of said packs while said packs remain serially connected.



5,488,283

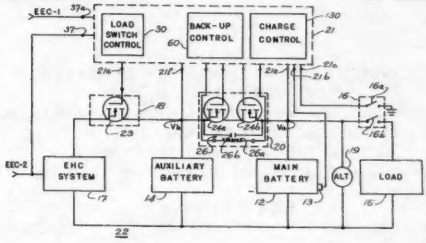
VEHICLE BATTERY SYSTEM PROVIDING BATTERY BACK-UP AND OPPORTUNITY CHARGING

Thomas J. Dougherty, Waukesha; William J. Wruck, Shorewood, and Richard J. Johnson, Hubertus, all of Wis., assignors to Globe-Union, Inc., Milwaukee, Wis.

Filed Sep. 28, 1993, Ser. No. 128,453

Int. Cl.[6] H01M *10/44;* **H02J** *7/14;7/34;* **B60L** *1/02*

U.S. Cl. 320—15 **20 Claims**



1. In a power supply system for a motor vehicle including a first storage battery for supplying electrical power to a primary load of the vehicle, said primary load including at least the starter motor and the ignition circuit Of the vehicle, the improvement comprising:

a second storage battery for supplying electrical power to an electrically heated catalytic converter system of the vehicle;

first switching means for connecting said electrically heated catalytic converter system to said second storage battery;

second switching means for connecting said second storage battery in parallel with said first storage battery;

and control means including means responsive to operation of an ignition switch of the vehicle to cause said first switching means to operate and connect said catalytic converter system to said second storage battery, and said control means including inhibit means for preventing said second switching means from connecting said second storage battery in parallel with said first storage battery when said catalytic converter system is connected to said second storage battery by said first switching means.

5,488,284

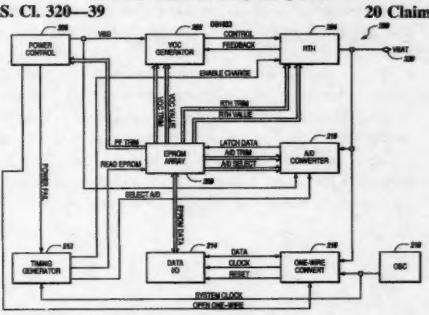
BATTERY CHARGER SYSTEMS AND METHODS

Donald R. Dias, Carrollton, and Eric W. Mumper, Dallas, both of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Filed Sep. 30, 1992, Ser. No. 953,906

Int. Cl.[6] H01M *10/42;* **H02J** *7/00*

U.S. Cl. 320—39 **20 Claims**



1. A battery charging system, comprising:

(a) a charging current output terminal having a voltage;

(b) a variable-voltage generator with an output node;

(c) a variable resistor; and

(d) a controller electrically coupled to said variable-voltage generator, to said variable resistor, and to said charging current output terminal, said controller comprising at least one memory for storing $(V_1, R_1, BP_1), (V_2, R_2, BP_2), \ldots (V_N, R_N, BP_N)$ where V_j is an output voltage, R_j is a resistance, and BP_j is a breakpoint voltage, wherein j is an index between 1 and n;

(e) wherein said controller can compare said voltage at said charging current output terminal to said BP_js and when said voltage at said charging current output terminal lies between BP_{j-1} and BP_j, said controller can drive said variable-voltage generator to provide said output voltage of V_j at said output node and can drive said variable resistor to provide said resistance of R_j between said output node and said charging current output terminal.

5,488,285

GAS-CONTROLLED BATTERY CHARGING DEVICE FOR A DRIVERLESS TRANSPORT VEHICLE

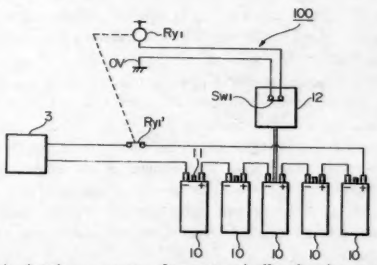
Eiji Hosobuchi, Ise, Japan, assignor to Shinko Electric Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1993, Ser. No. 114,137

Claims priority, application Japan, Aug. 31, 1992, 4-232397

Int. Cl.[6] H02J *7/02*

U.S. Cl. 320—46 **4 Claims**



4. A charging apparatus for automatically charging a sealed alkaline battery providing a motive power for a driverless transport vehicle, said apparatus comprising:

a charging station device having a power source for charging said sealed alkaline battery, a controller for controlling charging of said battery, data communication means, including electro-optical devices, for communicating data with said

driverless transport vehicle, and switching means for disconnecting said power source from said sealed alkaline battery when receiving a stopping signal through said data communication means; and

communication means, including electro-optical devices, disposed in said driverless transport vehicle device for communicating data with said data communication means disposed in said charging station device, wherein said communications means monitor an interior pressure of said sealed alkaline battery through a pressure sensor, generate said stopping signal and transmit said stopping signal to said switching means for disconnecting said power source from said sealed alkaline battery disposed in said charging station to prevent excessive pressure build up in the battery interior, thereby preventing release of damaging gases and corrosive vapors from an over-charged battery to an outside environment.

5,488,286

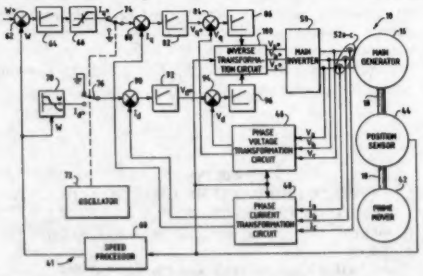
METHOD AND APPARATUS FOR STARTING A SYNCHRONOUS MACHINE

Gregory I. Rozman, Rockford; Albert L. Markunas, Roscoe; Michael J. Hanson, Loves Park, and Leland E. Weber, Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed May 12, 1993, Ser. No. 61,497

Int. Cl.[6] F02N *11/04*

U.S. Cl. 322—10 **11 Claims**



1. A method of starting a synchronous generator having a main generator portion with an armature winding and a field winding rotatable with respect to said armature winding and an exciter portion with a field winding and an armature winding rotatable with respect to said field winding, said method comprising the steps of:

(a) converting a parameter of power applied to the main generator portion armature winding to generate sensed direct and quadrature power components;

(b) comparing said sensed direct and quadrature power components with desired direct and quadrature power components to generate direct and quadrature power commands;

(c) applying power to said main generator portion armature winding based upon said direct power command during a first period of time;

(d) applying power to said main generator portion armature winding based upon said quadrature power command during a second period of time exclusive of said first period of time; and

(e) repeating said steps (c) and (d) a plurality of times in order to accelerate said synchronous generator to a threshold speed.

5,488,287

METHOD OF PRODUCING ELECTRICAL ENERGY BY MEANS OF GENERATORS AND USE OF THE METHOD IN VEHICLES WITH ANTI-SKID SYSTEMS

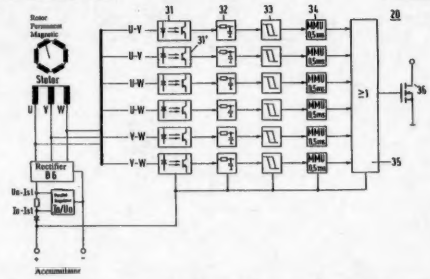
Axel Kemner, Isernhagen; Mahmud Keschwari, Barsinghausen, and Peter K. Zeller, Heubach, all of, Germany, assignors to Mannesmann Aktiengesellschaft A corporation of Germany, Dusseldorf, Germany

Filed Jun. 12, 1992, Ser. No. 898,904

Claims priority, application Germany, Jun. 12, 1991, 41 19 834.4

Int. Cl.[6] H02P *9/00*

U.S. Cl. 322—20 **7 Claims**



1. A method of producing electrical energy from rotary motion of an axle of a vehicle, by means of a generator assembly including a generator coupled to the axle, comprising determining the rate of rotation of the axle, carrying out the electrical energy production by the generator producing an induced electrical voltage pattern having upper and lower half-waves, each of which having a respective pulse parameter, carrying out the determination of the rate of rotation exclusively from the generator by evaluating the pulse parameters of the upper and lower half-waves of the induced electrical voltage pattern.

5,488,288

CIRCUIT ARRANGEMENT INTEGRATED IN A SEMICONDUCTOR CIRCUIT

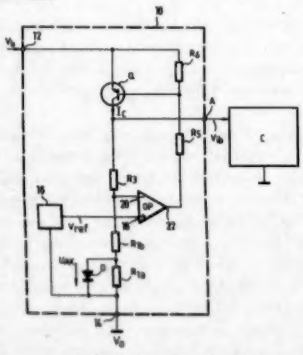
Werner Elmer, Moosburg, Germany, assignor to Texas Instruments Deutschland GmbH, Germany

Filed Nov. 12, 1992, Ser. No. 974,869

Claims priority, application Germany, Nov. 15, 1991, 41 37 730.3

Int. Cl.[6] G05F *1/46*

U.S. Cl. 323—284 **11 Claims**



1. A voltage control circuit for generating an internal adjustable operating voltage from an external supply voltage and maintaining the internal operating voltage at a substantially constant magnitude subject to adjustment, said voltage control circuit comprising:

an input terminal for receiving an external supply voltage;

an operational amplifier having inverting and non-inverting inputs and an output, the inverting input of said operational amplifier being connected to said input terminal;

a bipolar transistor having base, emitter and collector electrodes interconnected between said input terminal and the inverting input of said operational amplifier, the emitter electrode of said bipolar transistor being connected to said input terminal and the collector electrode of said bipolar transistor being connected to the inverting input of said operational amplifier;

a feed-back loop interconnecting the output of said operational amplifier and the base electrode of said bipolar transistor;

a reference voltage source for providing a reference voltage connected to the non-inverting input of said operational amplifier;

an output terminal connected to the collector electrode of said bipolar transistor at which the internal operating voltage for use by a digital circuit is produced;

a voltage divider having first and second serially connected resistors, the distal ends of said first and second resistors being respectively connected to the collector electrode of said bipolar transistor and to ground;

the inverting input of said operational amplifier being connected to a first node located between said first and second resistors;

said reference voltage source also being connected to ground;

said voltage divider including a third resistor connected in series to said first and second resistors and being interposed between said second resistor and ground;

a diode connected in parallel to said third resistor and having its anode connected to a second node located between said second and third resistors and its cathode connected between said reference voltage source and ground; and

said diode having a temperature sensing characteristic effective to adjust the internal operating voltage produced at said output terminal by providing a diode voltage inversely related to changes in temperature.

5,488,289

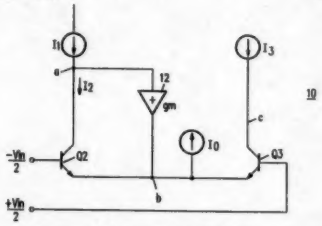
VOLTAGE TO CURRENT CONVERTER HAVING FEEDBACK FOR PROVIDING AN EXPONENTIAL CURRENT OUTPUT

Pak-Ho Yeung, San Jose, Calif., assignor to National Semiconductor Corp., Del.

Filed Nov. 18, 1993, Ser. No. 154,180

Int. Cl.[6] G05F *3/04;3/16;* **G06G** *7/10;7/12*

U.S. Cl. 323—312 **11 Claims**



1. A voltage to current converter comprising:

first and second input bipolar transistors, each having an emitter, a base, and a collector, said first and second input bipolar transistors being coupled at said emitters and accepting a selectable differential input voltage at said bases;

a reference current source connected to said collector of said first input bipolar transistor;

an output current source connected to said collector of said second input bipolar transistor, an output current of said output current source dependent on a current through said second input bipolar transistor; and

a feedback element connected between said coupled emitters and said collector of said first input bipolar transistor, and that senses a voltage at said collector of said first input bipolar transistor and regulates a voltage at said coupled emitters to maintain a constant current through said first input bipolar transistor

whereby an output current at said collector of said second input bipolar transistor varies exponentially with said differential input voltage.

5,488,290

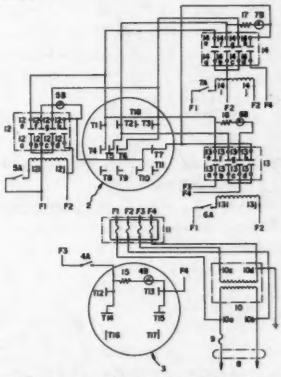
ENERGIZING DEVICES FOR KILOWATT HOUR METER DISPLAYS

Billie E. Black, 256 Sasser Dr., Eight Mile, Ala. 36613, assignor to Billie Eugene Black, Eight Mile, Ala.

Filed Sep. 3, 1993, Ser. No. 115,596

Int. Cl.[6] G01R *35/04*

U.S. Cl. 324—74 **15 Claims**



1. A kilowatt hour meter display energizing device for energizing digital displays of different types of kilowatt hour meters, the device comprising:

a first female multi-terminal socket means formed so as to accommodate at least a first type of kilowatt hour meter, said first socket means including a first plurality of female electrical sockets;

a second female multi-terminal socket means formed so as to accommodate at least a second type of kilowatt hour meter, said second socket means including a second plurality of female electrical sockets;

a first energizing circuit means operatively connected to said first socket means, for energizing a digital display of the first type of kilowatt hour meter;

a second energizing circuit means operatively connected to said second socket means, for energizing a digital display of the second type of kilowatt hour meter; and

a third energizing circuit means operatively connected to said first socket means, for energizing a digital display of third type of kilowatt hour meter;

voltage supply means connected to said first and second energizing circuits, for supplying a voltage thereto.

5,488,291

OPTICAL CURRENT TRANSFORMER

Hidenobu Koide, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

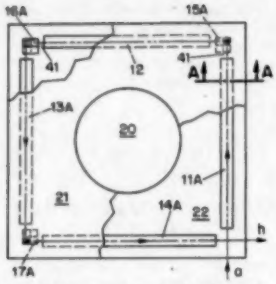
Filed Oct. 20, 1994, Ser. No. 326,584

Claims priority, application Japan, Jan. 21, 1993, 5-262833; Apr. 25, 1994, 6-086126

Int. Cl.[6] G01R *33/032;19/00;* **G02B** *6/42*

U.S. Cl. 324—96 **29 Claims**

1. An optical current transformer for measuring a current flowing through a conductor by transmitting a light beam about said current-carrying conductor, comprising:



(a) four Faraday effect glass rods, for transmitting said light beam, arranged in a rectangle to thereby form a through hole for said conductor;

(b) three optical path changing pieces, each for redirecting said light beam from one of said glass rods to a different one of said glass rods, and each being positioned at a different corner of said glass rod rectangle;

(c) two substrate plates, each having a through hole for said conductor, positioned at opposite sides of said glass rod rectangle to sandwich said glass rods and said optical path changing pieces therebetween; and

(d) means for substantially fixing the relative positions of said glass rods while allowing for thermal expansion and contraction of said glass rods.

5,488,292

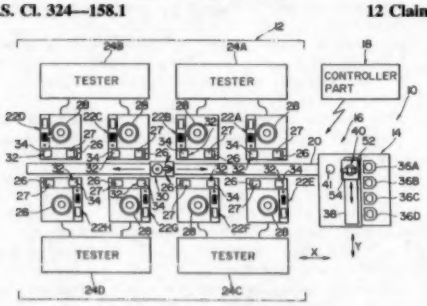
WAFER INSPECTING SYSTEM

Kiyoaki Tsuta, Mitaka, Japan, assignor to Tokyo Seimitsu Co., Ltd., Tokyo, Japan

Filed Oct. 4, 1993, Ser. No. 130,831

Int. Cl.[6] G01R *31/02*

U.S. Cl. 324—158.1 **12 Claims**



1. A wafer inspecting system, comprising:

a cassette storage device capable of storing a plurality of cassettes each cassette containing a plurality of wafers to be inspected;

a plurality of wafer probing devices arranged at predetermined intervals;

wafer conveying means for sequentially removing at least one of the plurality of wafers from one of the plurality of cassettes, moving each removed wafer to at least one of said plurality of wafer probing devices and returning each removed wafer which has been inspected by the at least one wafer probing device to the one of the plurality of cassettes from which the wafer was taken; and

control means for controlling the wafer conveying means.

5,488,293

METHOD OF CALIBRATING A MAGNETIC CHARACTER BEARING DOCUMENT

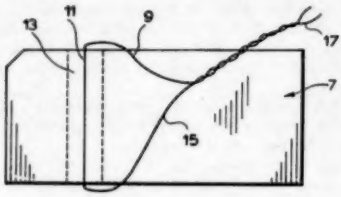
Paul D. Ross, 1107 Birchmount Road, Scarborough, Ontario, Canada

Continuation of Ser. No. 973,410, Nov. 9, 1992, abandoned.

This application May 4, 1994, Ser. No. 237,901

Int. Cl.[6] G01R *35/00;* **B07C** *5/344;* **G06K** *9/00*

U.S. Cl. 324—202 **4 Claims**



1. A method of calibrating a document having a magnetic character on said document, said method comprising measuring by testing equipment magnetic flux level of a known current passed through a specified conductor to establish a first signal having a first signal strength represented by a unit value, passing said document through said testing equipment to provide a second signal having a second signal strength produced by magnetic flux of said character and assigning a value to said second signal strength in comparison to and shown in units as a percentage of the unit value of the first signal strength.

5,488,294

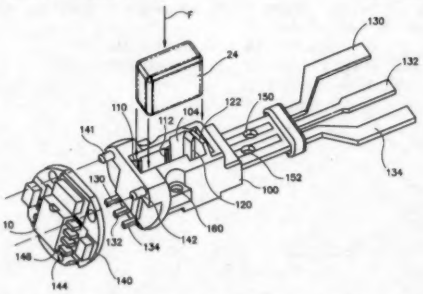
MAGNETIC SENSOR WITH MEANS FOR RETAINING A MAGNET AT A PRECISE CALIBRATED POSITION

Peter A. Liddell; Douglas L. Mueller, both of Freeport, and Gary L. Wohlers, Cedarville, all of Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 18, 1995, Ser. No. 374,020

Int. Cl.[6] G01B *7/14;* **G01R** *35/00*

U.S. Cl. 324—207.21 **20 Claims**



1. A magnetic sensor with adjustable magnet position for use during calibration of the magnetic sensor, comprising:

a carrier having a cavity formed therein;

a plurality of electrical leads molded into said carrier;

a magnet, said cavity being shaped to receive said magnet therein, said magnet being shaped to slide into said cavity in response to an external force;

means associated with said cavity for guiding said magnet along a preselected axis as said magnet slides into said cavity in response to said external force;

means associated with said cavity for resisting the movement of said magnet as said magnet slides into said cavity in response to said external force, said resisting means being deformable in response to forcible contact with said magnet as said magnet slides into said cavity in response to said external

force, said resisting means being shaped to retain said magnet in position within said cavity when said external force is not exerted against said magnet;

a magnetically sensitive component; and

a substrate, said magnetically sensitive component being attached to said substrate, said substrate being attached to said carrier.

5,488,295

METHOD AND APPARATUS FOR CANCELLING NOISE OF A LOW-NOISE SENSOR

Heikki Seppä, Helsinki, Finland, assignor to Valtion Teknillinen Tutkimuskeskus, Espoo, Finland

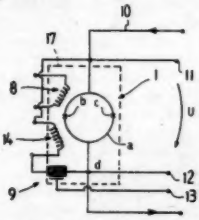
PCT No. PCT/FI91/00154, § 371 Date Nov. 12, 1992, § 102(e) Date Nov. 12, 1992, PCT Pub. No. WO91/18298, PCT Pub. Date Nov. 28, 1991

PCT Filed May 15, 1991, Ser. No. 952,885

Claims priority, application Finland, May 15, 1990, 902424

Int. Cl.[6] G01R *33/035*

U.S. Cl. 324—248 **7 Claims**



1. A method for processing an output signal of a low-noise sensor, particularly a sensor based on at least one Josephson junction, such as a SQUID, comprising the steps of:

connecting an adjustable resistor between an output port and an input port of the sensor to create a positive feedback from the output port to the input port;

feeding the output signal of the low-noise sensor at the output port back to the input port of the sensor; and

regulating resistance of the resistor by adjusting means so that an amplification of the sensor is set to be suitable.

5,488,296

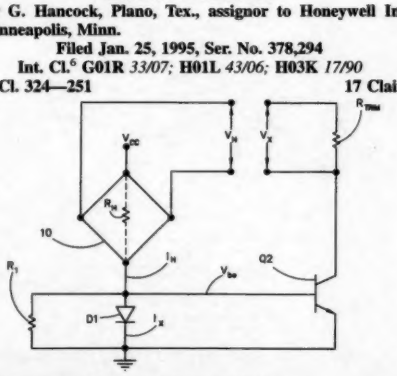
TEMPERATURE COMPENSATED MAGNETICALLY SENSITIVE CIRCUIT

Peter G. Hancock, Plano, Tex., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 25, 1995, Ser. No. 378,294

Int. Cl.[6] G01R *33/07;* **H01L** *43/06;* **H03K** *17/90*

U.S. Cl. 324—251 **17 Claims**



1. A magnetic sensing circuit, comprising:

a magnetically sensitive device;

first means, connected in electrical communication with said magnetically sensitive device, for providing an output signal that is representative of the strength of a magnetic field in a predetermined direction relative to said magnetically sensitive device;

second means for providing a reference signal;

means for comparing said output signal to said reference signal, said second providing means comprising a means for causing said reference signal to change as a function of temperature in a manner generally similar to the way that said output signal changes as a function of temperature; and

a diode is connected in series with said magnetically sensitive device between a power source and a point of ground potential, said causing means comprising a first resistor connected in parallel with said diode.

5,488,297

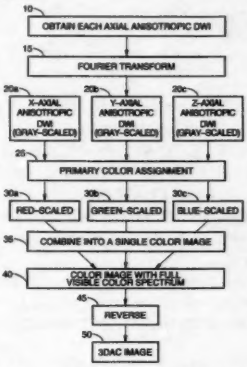
THREE DIMENSIONAL ANISOTROPY CONTRAST MAGNETIC RESONANCE IMAGING

Tsutomu Nakada, San Francisco, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Jul. 19, 1994, Ser. No. 277,670

Int. Cl.[6] G01V *3/14*

U.S. Cl. 324—309 **29 Claims**



1. A method for contrast imaging anisotropic motion of water molecules in an object, comprising the steps of:

(a) obtaining a plurality of gray-scaled diffusion weighted images of an identical slice of an object using magnetic resonance imaging, each said image being obtained by applying a diffusion gradient pulse in a single direction along a corresponding axis, each said axis being orthogonal in relation to each other axis;

(b) color scaling each said gray-scaled diffusion weighted image with a different primary color; and

(c) combining each said color-scaled diffusion weighted image to produce a single image.

5,488,298

APPARATUS AND METHOD FOR DECREASING MAGNETIC FIELD SENSITIVITY OF LONG RF PULSES

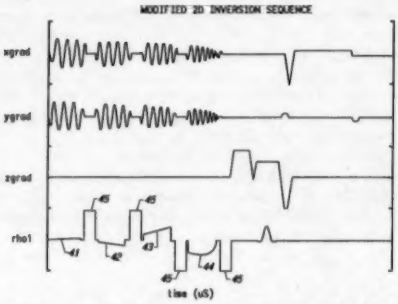
Graham Wright, Toronto, Canada, and John M. Pauly, San Francisco, Calif., assignors to Board of Trustees of the Leland Stanford University, Stanford, Calif.

Continuation of Ser. No. 101,148, Aug. 2, 1993, abandoned. This application Dec. 6, 1994, Ser. No. 351,572

Int. Cl.[6] G01R *33/48*

U.S. Cl. 324—309 **29 Claims**

1. In a method of multidimensional magnet resonance signal detection, the combination of steps including



a) placing an object in an inhomogeneous magnetic field, and

b) perturbing nuclei in said object with a multidimensional RF pulse, said RF pulse including a plurality of spaced apart RF signal segments with a plurality of refocusing pulses associated with segments for refocusing spins including a refocusing pulse between each adjacent pair of spaced apart segments.

5,488,299

NUCLEAR MAGNETIC RESONANCE IMAGING WITH IMPROVED IMAGE QUALITY AND OPERATION EFFICIENCY

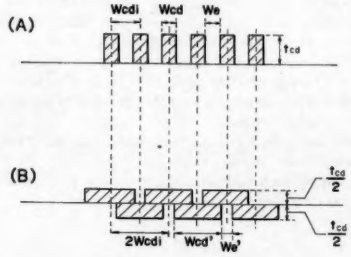
Masafumi Kondo, and Hiromi Kawamoto, both of Tochigi, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 12, 1993, Ser. No. 31,185

Claims priority, application Japan, Mar. 13, 1992, 4-055648; Mar. 31, 1992, 4-106198; Sep. 11, 1992, 4-243759; Feb. 25, 1993, 5-035982

Int. Cl.[6] G01V *3/00*

U.S. Cl. 324—318 **11 Claims**



1. An active shield gradient coil to be used in nuclear magnetic resonance imaging, comprising:

inner primary coil means for generating a desired gradient magnetic field within a desired imaging space; and

outer shielding coil means, provided in a vicinity of the inner primary coil means, for shielding the gradient magnetic field generated by the inner primary coil means outside of the desired imaging space;

wherein at least one of the inner primary coil means and the outer shielding coil means has coil members provided on a plurality of separate layers, one different coil member in each layer, mutually connected electrically.

5,488,300

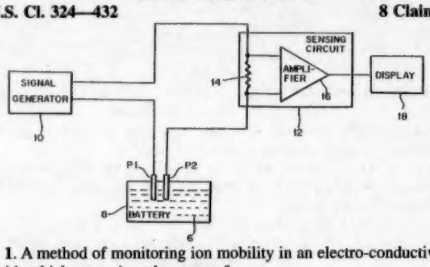
METHOD AND APPARATUS FOR MONITORING THE STATE OF CHARGE OF A BATTERY

Robert S. Jamieson, 40 Misty Meadow Dr., Boynton Beach, Fla. 33462

Filed Oct. 21, 1994, Ser. No. 327,350

Int. Cl.[6] G01N *27/416*

U.S. Cl. 324—432 **8 Claims**



1. A method of monitoring ion mobility in an electro-conductive fluid, which comprises the steps of:

immersing at least one pair of test electrodes at least partially in the electro-conductive fluid;

generating a test signal having a pulsed waveform, the pulsed waveform of the test signal having an amplitude which remains constant for a predetermined time sufficient to ensure that ion mobility in the electro-conductive fluid has reached a steady state velocity;

applying the test signal to the at least one pair of test electrodes to cause a current to flow through the test electrodes and the electro-conductive fluid; and

sensing the current flow through the test electrodes and the electro-conductive fluid caused by the test signal, the sensed current being indicative of ion mobility in the electro-conductive fluid.

5,488,301

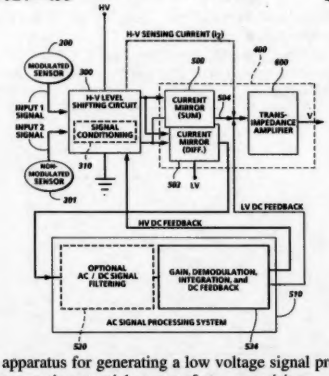
ELECTROSTATIC VOLTMETER EMPLOYING A DIFFERENTIAL CASCODE

Alan J. Werner, Jr., Rochester, N.Y.; Mohamad M. Mojaradi, Los Angeles, Calif.; Mehrdad Zomorrodi, West Hills, Calif.; Steven A. Buhler, Redondo Beach, Calif., and Tuan A. Vo, Hawthorne, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 19, 1994, Ser. No. 359,170

Int. Cl.[6] G01R *21/12*

U.S. Cl. 324—458 **12 Claims**



1. An apparatus for generating a low voltage signal proportional to an electrostatic potential on a surface, comprising:

a non-contacting sensor for producing an input signal representative of the electrostatic potential on the surface;

a high-voltage source adapted to produce a first potential of first polarity;

a high-voltage level shifting circuit, powered by said high-voltage source and including an input conditioning circuit for reducing transient variations in the input signal produced by said sensor, said high-voltage level shifting means generating a first signal referenced to ground in response to the conditioned input signal output from the input signal conditioning circuit; and

a circuit, connected to receive the first signal from said high-voltage level shifting means, for converting the first signal to a low voltage signal, said low voltage signal being referenced to ground potential.

5,488,302

Patent Not Issued For This Number

5,488,303

GFCI WITH AUXILIARY COIL CURRENT BLOCKING MEANS AND IMPROVED TEST BUTTON CONFIGURATION

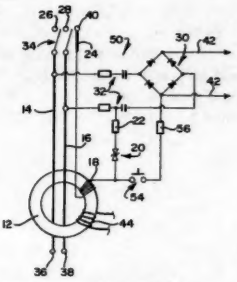
Dante Bagalini, Johannesburg, South Africa, assignor to Circuit Breakers Industries Ltd., Johannesburg, South Africa

Continuation of Ser. No. 120,669, Sep. 13, 1993, abandoned. This application May 31, 1995, Ser. No. 455,597

Claims priority, application South Africa, Jul. 9, 1993, 93/4962

Int. Cl.[6] H02H *3/26*

U.S. Cl. 324—509 **11 Claims**



1. A ground fault interrupter comprising:

a core;

a plurality of wires including at least two load current carrying wires, said load current carrying wires passing through the core, said load current carrying wires being connectable between electrical supply means and a load for supplying current to said load;

a primary coil on the core for detecting a current imbalance in said load current carrying wires;

an auxiliary coil on the core;

an electrical circuit connecting said auxiliary coil to first and second wires selected from said plurality of wires, said electrical circuit being operable to carry current to said auxiliary coil when a voltage exists between said first and second wires, and a current blocking means in said circuit to provide current flow to said auxiliary coil only when the voltage between said first and second wires exceeds a predetermined value, said current blocking means being connected in said circuit in series with said auxiliary coil between said first and second wires to be responsive to a voltage difference between said first and second wires;

a DC supply arrangement connected between a selected pair of said plurality of wires for supplying power to the DC supply arrangement; and

a test button,

said auxiliary coil having one end connected via said current blocking means to the first said wire and an opposite end connected to the second said wire,

said second wire being a ground wire and said opposite end of the auxiliary coil being directly connected to said second wire; and

said test button being connected between said one end of said auxiliary coil and said DC supply arrangement.

5,488,304

METHOD AND APPARATUS FOR JUDGING ACTIVE/DEAD STATUS OF COMMUNICATION CABLE

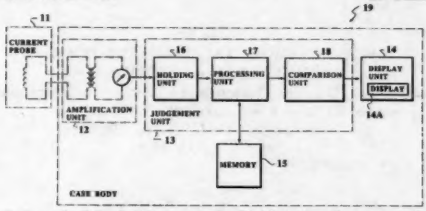
Toshiharu Hamade, Toyamaken; Masaichi Shiotani, Ishikawaken; Yukio Shimo, Ishikawaken, and Munehiko Higashikata, Ishikawaken, all of, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Jun. 2, 1994, Ser. No. 252,950

Claims priority, application Japan, Jun. 2, 1993, 5-131613

Int. Cl.[6] G01R *31/12*

U.S. Cl. 324—520 **20 Claims**



1. A method for judging an active/dead status of a communication cable, comprising the steps of:

storing in advance data representing a frequency spectrum of signals on a communication cable measured in a state in which the communication cable is known to be active/dead;

measuring the data representing the frequency spectrum of the signals on a communication cable to be judged by detecting signals on the communication cable to be judged while electromagnetically coupling a probe to the communication cable to be judged; and

judging the active/dead status of the communication cable to be judged according to a result of comparing a prescribed threshold with a difference of the data representing the frequency spectrum stored at the storing step and the data representing the frequency spectrum measured at the measuring step.

5,488,305

SYSTEM AND METHOD FOR HIGH-SPEED POTENTIOMETRY USING SCANNING PROBE MICROSCOPE

David M. Bloom, Portola Valley; Francis Ho, Stanford, and Alfred S. Hou, Menlo Park, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Division of Ser. No. 984,891, Dec. 2, 1992, Pat. No. 5,381,101. This application Sep. 28, 1994, Ser. No. 313,758

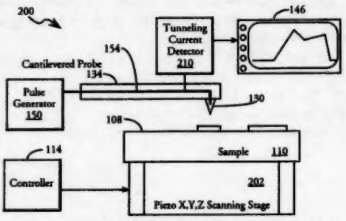
Int. Cl.[6] G01B *5/28*

U.S. Cl. 324—537 **15 Claims**

1. An apparatus for measuring an electrical waveform existing at the surface of a sample, said periodic waveform being of a predefined frequency, comprising:

a sampling signal generator that generates a sampling signal having a sample signal repetition frequency offset from said predefined repetition frequency by a difference frequency;

a probe coupled to said sampling signal generator for carrying said sampling signal to a position proximate and surface of said sample with a gap separating said probe from said surface so as to assert a time varying gap voltage across said gap, said time varying gap voltage generating a corresponding



tunneling current through the gap between said probe and said surface of said sample; wherein said tunneling current is a nonlinear function of said gap voltage such that said tunneling current includes a mixing component that replicates said electrical waveform at a repetition rate equal to said difference frequency; and

a current detection circuit coupled to said probe that senses said mixing component of said tunneling current.

5,488,306

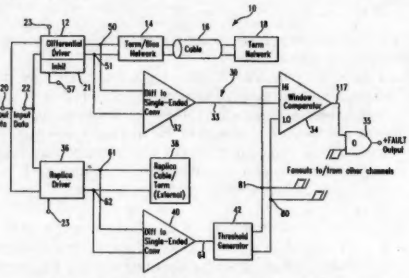
OPEN AND SHORT FAULT DETECTOR FOR A DIFFERENTIAL INTERFACE

Anthony R. Bonaccio, Shelburne, Vt., assignor to International Business Machines Corp., Armonk, N.Y.

Filed May 31, 1994, Ser. No. 250,963

Int. Cl.[6] G01R *31/02*

U.S. Cl. 324—539 **9 Claims**



2. A cable fault detection system in which the detection is independent of the ground shift comprising:

means for applying differential voltages to said cable;

means for sensing said differential voltages applied to said cable; and

means for generating a threshold window that defines the acceptable range for the differential voltages applied to said cable said threshold window being independent of any ground shifts in said cable;

means for detecting if said sensed differential voltages in said cable are within or outside said threshold window.

5,488,307

SENSOR INTERFACE METHOD AND APPARATUS

Robert J. Plott, Mentor, Ohio, assignor to Namco Controls Corporation, Highland Hts., Ohio

Filed Dec. 22, 1993, Ser. No. 172,571

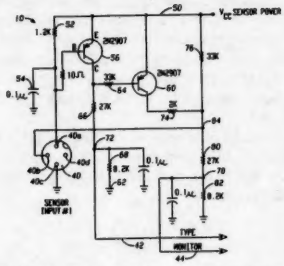
Int. Cl.[6] G01R *31/02*

U.S. Cl. 324—555 **7 Claims**

1. Sensor interface apparatus that can be coupled to a cable for conducting signals to a sensor comprising:

a) an electrical connector having three conductive contacts for mating with either a two-wire or three-wire cable connected to a sensor;

b) an interface circuit including a power conductor coupled to a first of the three conductive contacts of the connector; said



interface circuit including: i) a current sensing circuit coupled to said first of the said three conductive contacts for sensing current flowing through said first contact to distinguish between a three-wire and two-wire cable connected to the sensor; ii) a sensor status monitoring circuit connected to another of said three contacts for monitoring a status of said sensor and iii) an output circuit for providing one output signal related to a type of sensor and a second output signal related to a status of the sensor as determined by the current sensing and status monitoring circuits.

5,488,308

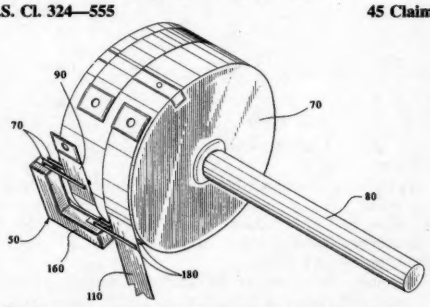
APPARATUS AND METHOD FOR DETECTING BREAKAGE OF A DRIVE BAND IN A PACKAGING MACHINE

Arde Kirka, 1100 Tanglewood, Algonquin, Ill. 60102; David Persells, 613 Torrey Pines, Twin Lakes, Wis. 53181; Roland Andersson, 2786 Old Buffalo Grove Rd., Arlington Heights, Ill. 60004, and Shigehiro Kinoshita, 1124 Johnson Dr., Apt. 3536, Buffalo Grove, Ill. 60089

Filed Jul. 20, 1994, Ser. No. 277,614

Int. Cl.[6] G01R *31/00*

U.S. Cl. 324—555 **45 Claims**



37. An apparatus for detecting breakage of an electrically conductive band, the apparatus comprising:

a) an electrically conductive probe disposed proximate the electrically conductive band and spaced from the electrically conductive band to facilitate electrical contact between the probe and the electrically conductive band upon breakage of the electrically conductive band, the electrically conductive band being connected to ground;

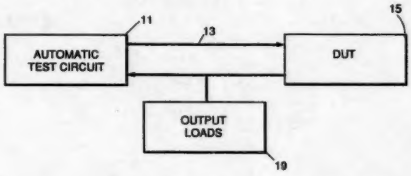
b) a continuity checking circuit connected to the electrically conductive band and the electrically conductive probe, contact between the electrically conductive probe and the electrically conductive band resulting in electrical continuity therebetween, the electrical continuity being detected by the continuity checking circuit to provide a signal output indicative of the breakage of the electrically conductive band.

5,488,309

METHOD OF TESTING THE OUTPUT PROPAGATION DELAY OF DIGITAL DEVICES

William D. Farwell, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 1, 1993, Ser. No. 143,957
Int. Cl.[6] G01R 15/12
U.S. Cl. 324—617 3 Claims



1. A test system for testing output propagation delays of selected outputs of a digital integrated circuit having inputs and wherein each output has a specified internal propagation delay, comprising:

a test circuit for applying input signals to selected inputs of the digital integrated circuit and for sampling selected outputs of the digital integrated circuit; and

respective loads for each of the selected outputs, each load having an impedance that is configured such that the sum of the specified internal delay for such output and a load dependent delay for such output comprises a total test propagation delay that is substantially identical for all of the selected outputs;

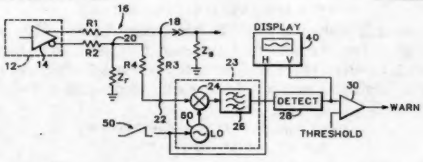
said test circuit further sampling all of the selected outputs simultaneously and comparing the sampled outputs with expected output values.

5,488,310

RETURN-LOSS DETECTION FOR SERIAL DIGITAL SOURCE

Daniel G. Baker, Aloha; Robert W. Parish, Gaston, and Scott E. Zink, Portland, all of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Filed Aug. 22, 1994, Ser. No. 294,274
Int. Cl.[6] G01R 17/00
U.S. Cl. 324—648 8 Claims



1. A return-loss detector for a serial digital signal source comprising:

means for generating a differential pair of serial digital signals from a serial digital signal output by the serial digital signal source;

a bridge circuit having as inputs the differential pair of serial digital signals and having a reference output terminal and a system output terminal, the system output terminal being coupled to a system being driven by the serial digital signal;

a detector coupled to the output terminals of the bridge circuit; and

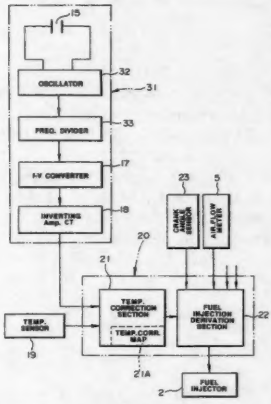
means for indicating from the output from the detector when a termination mismatch at the system output terminal occurs.

5,488,311

APPARATUS AND METHOD FOR MEASURING ALCOHOL CONCENTRATION OF LIQUID BLENDED WITH ALCOHOL APPLICABLE TO AN AUTOMOTIVE VEHICLE MOUNTED INTERNAL COMBUSTION ENGINE

Hideki Kamioka; Kazumitsu Kobayashi; Masahiko Shimamura, all of Isezaki, and Kiyoshi Takeuchi, Yokohama, all of, Japan, assignors to Japan Electronic Control Systems Co., Ltd., Isezaki, and Nissan Motor Company, Limited, Yokohama, both of, Japan

Continuation of Ser. No. 862,646, Apr. 3, 1992, abandoned, which is a continuation-in-part of Ser. No. 705,617, May 29, 1991, abandoned. This application Aug. 10, 1994, Ser. No. 288,427
Claims priority, application Japan, May 30, 1990, 2-140327
Int. Cl.[6] G01N 27/22
U.S. Cl. 324—674 11 Claims



1. An apparatus for measuring an alcohol concentration of a liquid blended with alcohol, comprising:

a) an electrostatic capacitance detector, having electrodes immersed in said liquid, for detecting an electrostatic capacitance between said electrodes;

b) an oscillator coupled to said electrostatic capacitance detector and configured to oscillate at a frequency based on an amount of said electrostatic capacitance detected by said electrostatic capacitance detector, said oscillator oscillates at said frequency in a frequency range of 10 Mhz or more dependent on said alcohol concentration;

c) a frequency divider coupled to said oscillator and configured to divide said frequency from said oscillator and to output a divided frequency indicative thereof; and

d) a frequency-to-voltage converter coupled to said frequency divider and configured to convert said divided frequency into a corresponding voltage.

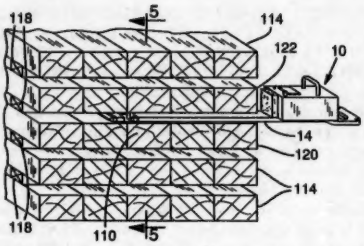
5,488,312

METER WITH PROBE FOR MEASURING THE MOISTURE CONTENT OF STACKED WOOD

Robert T. Havener, Grants Pass, and Edward D. Wagner, Rogue River, both of Oreg., assignors to Wagner Electronic Products, Inc., Rogue River, Oreg.

Division of Ser. No. 992,733, Dec. 18, 1992, Pat. No. 5,402,076. This application Dec. 2, 1994, Ser. No. 348,457
Int. Cl.[6] G01R 27/26
U.S. Cl. 324—689 19 Claims

19. A method of measuring the moisture content of stacked wood using a probe having an elongated body and an extendable member, the method comprising:



inserting the probe between a first and a second layer of stacked wood; and

moving the extendable member relative to the body of the probe and against wood of the first layer to urge the body away from the first layer and towards the second layer.

5,488,313

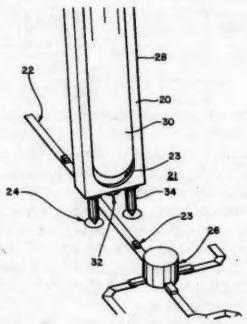
TEST PROBE AND CIRCUIT BOARD ARRANGEMENT FOR THE CIRCUIT UNDER TEST FOR MICROSTRIP CIRCUITRY

Stanley J. Gourse, Highland; Eugene Fischer, Upper Marlboro, and George A. Harrison, Pasadena, all of Md., assignors to Litton Systems, Inc., Woodland Hills, Calif.

Filed Jul. 16, 1993, Ser. No. 92,616

Int. Cl.[6] G01R *1/06*

U.S. Cl. 324—754 **2 Claims**



1. An arrangement for sensing the electrical characteristics of a signal being carried on a microstrip circuit, wherein the microstrip circuit is mounted on a dielectric substrate having a ground plane on one surface thereof and a microstrip electrical circuit on the other, the arrangement comprising:

at least one electrically conductive test point extending from and electrically connected to said ground plane through said substrate to said other surface adjacent said microstrip circuit at a point thereon where it is desired that electrical measurements be made,

a probe housing having a length of microstrip line extending from an end thereof the length of the probe housing to a connector means connectable to an external measuring device,

a contact element carried on said end of said probe housing and adapted to be placed in contact with and electrically coupled to said length of microstrip line for engaging with the microstrip circuit and

ground contact means carried on said probe housing for engagement with said test point and electrically connected through said probe housing to said connector means.

5,488,314

BUCKLING BEAM TEST PROBE ASSEMBLY

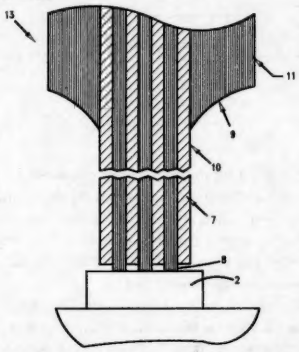
Wolfram Brandt, Sindelfingen; Bernd Marquart, Weil im Schoenbuch, and Roland R. Stoehr, Nufringen, all of, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 10, 1994, Ser. No. 209,577

Claims priority, application European Pat. Off., Jul. 23, 1993, 93111786

Int. Cl.[6] G01R *1/04;1/073*

U.S. Cl. 324—758 **18 Claims**



1. A buckling beam test probe assembly for electrically testing a device provided with a plurality of contact pads, comprising:

current carrying electrically conductive contact probes, each of said probes including an inner core surrounded by an outer sheath, each of said probes comprising a plurality of fibers protruding from said core;

a stack of perforated plates, wherein each of said probes passes through one perforation in each of said perforated plates; and

a stripper plate positioned under said perforated plates, comprised of sections that are offset with respect to each other, said stripper plate being further provided with guiding channels so that probes passing through said guiding channels are deflected laterally by an amount determined by said offset and by the diameter of said channels, thereby providing each of said probes with controllable wiping of said contact pads.

5,488,315

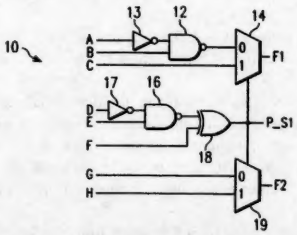
ADDER-BASED BASE CELL FOR FIELD PROGRAMMABLE GATE ARRAYS

Shivaling S. Mahant-Shetti; Manisha Agarwala, both of Richardson, Tex.; Mahesh M. Mehendale, Bangalore, Ind.; Robert J. Landers, Plano, and Mark G. Harward, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 5, 1995, Ser. No. 369,060

Int. Cl.[6] H03K *19/173;19/177*

U.S. Cl. 326—37 **15 Claims**



1. A base cell for a field programmable gate array, comprising:

a first inverter having an input and an output, the input of the first inverter operable to receive a first input signal to the base cell;

a first NAND gate having a first input, a second input and an output, the first input of the first NAND gate coupled to the output of the first inverter and the second input of the first NAND gate operable to receive a second input signal to the base cell;

a first 2:1 multiplexer having a "0" input, a "1" input, a "select" input and an output, the "0" input of the first 2:1 multiplexer coupled to the output of the first NAND gate and the "1" input of the first 2:1 multiplexer operable to receive a third input signal to the base cell, such that the output of the first 2:1 multiplexer represents a first function;

a second inverter having an input and an output, the input of the second inverter operable to receive a fourth input signal to the base cell;

a second NAND gate having a first input, a second input and an output, the first input of the second NAND gate coupled to the output of the second inverter and the second input of the second NAND gate operable to receive a fifth input signal to the base cell;

an XOR gate having a first input, a second input and an output, the first input of the XOR gate coupled to the output of the second NAND gate, the second input of the XOR gate operable to receive a sixth input signal to the base cell, and the output of the XOR gate coupled to the "select" input of the first 2:1 multiplexer, such that the output of the XOR gate represents a partial sum function;

a second 2:1 multiplexer having a "0" input, a "1" input, a "select" input and an output, the "0" input of the second 2:1 multiplexer operable to receive a seventh input signal to the base cell, the "1" input of the second 2:1 multiplexer operable to receive an eighth input signal to the base cell and the "select" input of the second 2:1 multiplexer coupled to the output of the XOR gate, such that the output of the second 2:1 multiplexer represents a second function.

5,488,316

CIRCUIT FOR SELECTING A BIT IN A LOOK-UP TABLE

Ross H. Freeman, San Jose, and Hung-Cheng Hsieh, Sunnyvale, both of Calif., assignors to Xilinx, Inc., San Jose, Calif.

Division of Ser. No. 284,935, Aug. 1, 1994, Pat. No. 5,432,719, which is a division of Ser. No. 387,566, Jul. 28, 1989, Pat. No. 5,343,406. This application Apr. 26, 1995, Ser. No. 429,434

Int. Cl.[6] H03K *19/173*

U.S. Cl. 326—41 **3 Claims**

1. A structure for selecting a bit in a look-up table including a first input line for receiving a first input signal and a second input line for receiving a second input signal, said structure comprising:

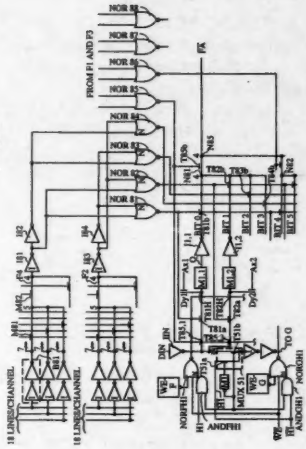
a first inverter coupled to said first input line for providing the complement of said first input signal;

a second inverter coupled to said first inverter for providing the logic state of said first input signal;

a third inverter coupled to said second input line for providing the complement of said second input signal; and

a fourth inverter coupled to said third inverter for providing the logic state of said second input signal;

a first, second, third, and fourth logic gate, wherein said first inverter is coupled to said first and second logic gates, said second inverter is coupled to said third and fourth logic gates, said third inverter is coupled to said second and fourth logic gates, and said fourth inverter is coupled to said first and third logic gates, wherein each of said logic gates controls the transfer of a bit in said look-up table.



5,488,317

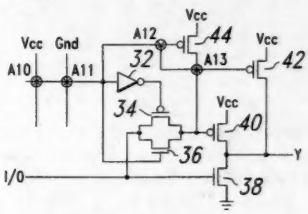
WIRED LOGIC FUNCTIONS ON FPGA'S

William S. Webster, Dallas, and David D. Wilmoth, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 22, 1993, Ser. No. 141,339

Int. Cl.[6] H03K *19/088;19/094*

U.S. Cl. 326—45 **14 Claims**



1. A field programmable logic array having a plurality of logic modules, comprising:

a configurable output driver in each of said plurality of logic modules that enables a plurality of output nodes of said plurality of logic modules to be connected together for a wired logic function and that enables each of said plurality of output nodes to be connected separately to one of a plurality of output lines, wherein said configurable output driver comprises:

a p-channel driver transistor connected to one of said output nodes:

a n-channel driver transistor connected between said one of said output nodes and ground; and

driver disable circuitry operable to disable said p-channel driver transistor when said plurality of output nodes are to be connected together, said driver disable circuitry comprising:

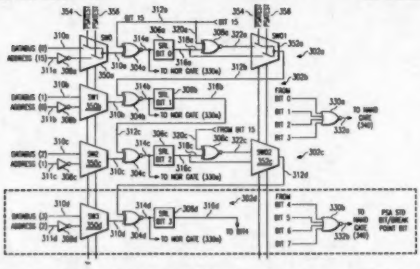
a first programmable element connected between said driver disable circuitry and logic signal in order to provide a high logic signal to a gate of said p-channel driver transistor; and

a second programmable element connected between said driver disable circuitry and a second logic signal in order to supply an internal logic signal to said gate of said p-channel driver transistor.

5,488,318
MULTIFUNCTION REGISTER

Sridhar Vajapey, Sugarland; Paul W. Krause, Sugar Land, and John M. Bach, Stafford, all of Tex., assignors to Texas Instruments, Dallas, Tex.

Filed Oct. 4, 1994, Ser. No. 317,953
Int. Cl.[6] H03K *21/00;19/20*
U.S. Cl. 326—46 11 Claims



11. A register cell for a multifunctional register, comprising:

an input multiplexer for selecting between two input signals responsive to one or more control signals and having a first output signal,

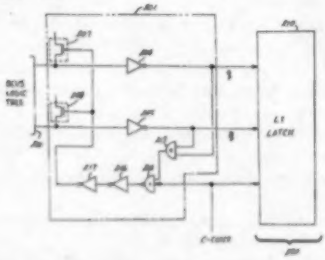
an input exclusive not OR circuit having a first input connected to said first output signal and a second input connected to a cell output signal and having a second output signal, and

a shift register latch having an input connected to said second output signal and having a cell output signal.

5,488,319
LATCH INTERFACE FOR SELF-RESET LOGIC

Tin-chee Lo, Fishkill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 18, 1994, Ser. No. 292,673
Int. Cl.[6] H03K *19/0948*
U.S. Cl. 326—115 5 Claims

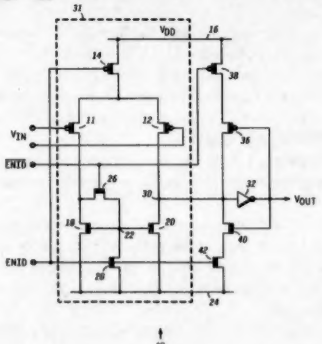


1. In combination, a logic circuit having an output terminal and including a logic tree and a reset circuit operative to reset the logic tree and a latch having an input terminal connected to the output terminal of the logic circuit, the latch responsive to a clock signal for periodically latching the output of the logic circuit, the reset circuit connected to the output terminal of the logic circuit and to the input terminal of the latch and responsive to a signal on the input terminal of the latch and the clock signal to reset the logic tree.

5,488,320
COMPARATOR HAVING LATCHED OUTPUT WHEN DISABLED FROM THE POWER SUPPLY

James S. Carvella, and John H. Quigley, both of Phoenix, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 4, 1994, Ser. No. 223,400
Int. Cl.[6] H03K *3/289;5/22*
U.S. Cl. 327—65 9 Claims



1. A comparator circuit, comprising:

an input stage coupled for receiving a differential input signal and providing a single-ended output signal at a first node;

first means for enabling and disabling a power supply to said input stage in response to a control signal;

an inverting buffer having an input coupled to said first node and having an output for providing an output signal of the comparator circuit; and

second means coupled between said output of said buffer in said first node for feeding back said output signal of the comparator circuit to said first node to latch said output signal of the comparator, said second means including,

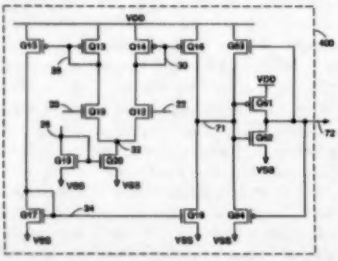
(a) a first transistor having a gate, a drain and a source, said gate being coupled for receiving an inverted control signal, said source being coupled to a first power supply conductor, and

(b) a second transistor having a gate, a drain and a source, said source being coupled to said drain of said first transistor, said gate being coupled to said output of said inverting buffer, said drain being coupled to said first node.

5,488,321
STATIC HIGH SPEED COMPARATOR

Mark G. Johnson, Los Altos, Calif., assignor to Rambus, Inc., Mountain View, Calif.

Continuation of Ser. No. 45,324, Apr. 7, 1993, abandoned.
This application May 16, 1995, Ser. No. 441,956
Int. Cl.[6] H03K *5/22;5/08*
U.S. Cl. 327—66 4 Claims



3. A comparator circuit, comprising:

a transconductance stage for sensing a first input voltage on a first input node and a second input voltage on a second input

node, the transconductance stage generating a first current into a feedback node, the first current indicating whether the first or the second input voltage has a greater magnitude;

a transresistance stage coupled to the feedback node, the transresistance stage sensing the first current while providing negative feedback that limits a voltage swing at the feedback node, the transresistance stage generating an output voltage at an output node that indicates whether the first or the second input voltage has a greater magnitude, wherein the transresistance stage comprises:

an inverter circuit coupled between the feedback node and the output node;

a first transistor configured to function as a first diode coupled between the feedback node and the output node, the first transistor configured to function as the first diode having a source coupled to the feedback node and having a gate and a drain each coupled to the output node;

a second transistor configured to function as a second diode coupled between the feedback node and the output node, the second transistor configured to function as the second diode having a source coupled to the feedback node and having a gate and a drain each coupled to the output node.

5,488,322

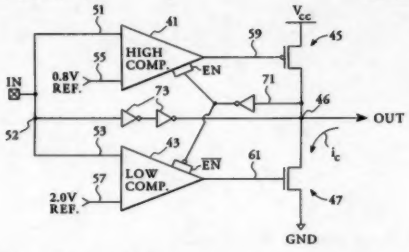
DIGITAL INTERFACE CIRCUIT WITH DUAL SWITCHING POINTS FOR INCREASED SPEED

Cecil H. Kaplinsky, 140 Melville Ave., Palo Alto, Calif. 94301

Filed Aug. 29, 1994, Ser. No. 297,641

Int. Cl.[6] H03K *5/153*

U.S. Cl. 327—74 **10 Claims**



1. A circuit, comprising

a pull-up transistor and a pull-down transistor connected in series between a pair of power supply terminals, a node between said pull-up and pull-down transistors constituting a circuit output,

means, connected to a circuit input and to a control terminal of said pull-up transistor, for effecting pull-up operation of said pull-up transistor whenever an input signal received from said circuit input exceeds a first reference voltage less than a nominal transition voltage,

means, connected to said circuit input and to a control terminal of said pull-down transistor, for effecting pull-down operation of said pull-down transistor whenever said input signal received from said circuit input falls below a second reference voltage greater than said nominal transition voltage,

means for disabling said means for effecting pull-up operation whenever a voltage at said circuit output is greater than said nominal transition voltage and for disabling said means for effecting pull-down operation whenever said voltage at said circuit output is less than said nominal transition voltage, and

a low-conductance antidrift buffer connected between said circuit input and said circuit output.

5,488,323

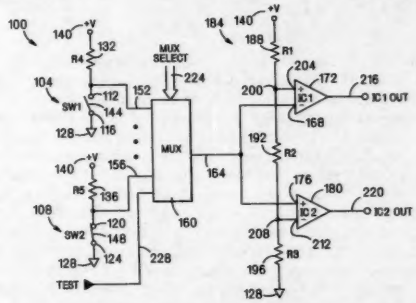
TRUE HYSTERESIS WINDOW COMPARATOR FOR USE IN MONITORING CHANGES IN SWITCH RESISTANCE

William H. Beacham, Jr., Enfield, Conn., and Erik C. Lillestolen, Colorado Springs, Colo., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 14, 1994, Ser. No. 355,482

Int. Cl.[6] H03K *5/153*

U.S. Cl. 327—74 **20 Claims**



1. Apparatus for interfacing with at least one two-position switch that is operative between an opened position in which there is no physical contact between two terminals of the switch, thereby defining an opened circuit and an infinite impedance of the switch between the two terminals, and a closed position in which the two terminals are physically shorted together, thereby defining a closed circuit and zero impedance between the two terminals, the apparatus being operative to indicate when the switch is in the opened and closed positions, the apparatus also operative to indicate a faulty condition of the switch in which the switch has a finite impedance value that is between a predetermined impedance range, the apparatus comprising:

a. a resistor connected at one end to a first predetermined voltage value and connected at a second opposite end to the first terminal of the: switch, the second terminal of the switch being operable to be connected to a second predetermined voltage value that is different than the first predetermined voltage value; and

b. means, connected with the first terminal of the switch, for determining when the switch is closed by determining when the switch has an impedance value that is less than a predetermined low impedance value, for determining when the switch is opened by determining when the switch has an impedance value that is greater than a predetermined high impedance value, and for determining when the switch is faulty by determining when the switch has an impedance value that is in between the predetermined high impedance value and the predetermined low impedance value.

5,488,324

DETECTION CIRCUIT FOR DETECTING A STATE OF A CONTROL SYSTEM WITH IMPROVED ACCURACY

Satoru Mizuta, and Katsuya Shimizu, both of Kasugai, Japan, assignors to Fujitsu Limited, Kawasaki, and Fujitsu VLSI Limited, Kasugai, both of, Japan

Continuation of Ser. No. 880,026, May 8, 1992, abandoned. This application Sep. 6, 1994, Ser. No. 300,939

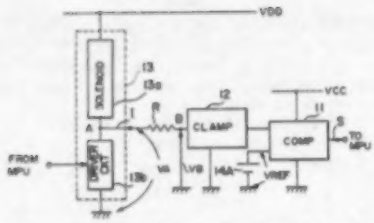
Claims priority, application Japan, May 8, 1991, 3-102874

Int. Cl.[6] H03K *19/08*

U.S. Cl. 327—77 **9 Claims**

1. A detection circuit for detecting a state of an object circuit comprising:

voltage-current conversion means, supplied with a first voltage signal indicative of the state of said object circuit, for producing an output current having a magnitude indicative of said state in response to said first voltage signal;



detection means, activated by a supply voltage and supplied with a second voltage signal, for detecting said state of said object circuit in response to said second voltage signal; and

clamping means, having an input terminal to which said output current of said voltage-current conversion means is supplied, for clamping a voltage of said input terminal at a predetermined level and producing said second voltage signal in response to said output current, such that said second voltage signal has a magnitude proportional to said first voltage signal and such that said magnitude of said second voltage signal is smaller than said supply voltage, said clamping means supplying said second voltage signal to said detection means, said second voltage comprising the voltage produced across said second resistor, said clamping means comprising:

a first bipolar transistor having an emitter supplied with said output current, a base supplied with a predetermined fixed bias voltage and a collector connected to ground via a second resistor and controlling a current flow through, and corresponding voltage produced across, the second resistor, and;

a bias voltage source which supplies said predetermined, fixed bias voltage to said base of said first bipolar transistor,

said detection means comprising:

a comparator circuit supplied with, and comparing, said second voltage signal and a reference voltage signal and producing an output voltage signal as a result of the comparison of said second voltage signal with said reference voltage; and

a reference circuit which produces said reference voltage, said reference circuit comprising a second bipolar transistor having an emitter supplied with said supply voltage via a third resistor, a base supplied with said predetermined, fixed bias voltage, and a collector connected to ground via a fourth resistor.

5,488,325

TIMING GENERATOR INTENDED FOR SEMICONDUCTOR TESTING APPARATUS

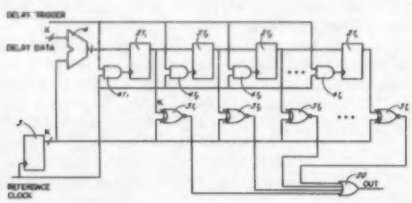
Masatoshi Sato, Gyoda, and Noriyuki Masuda, Ageo, both of, Japan, assignors to Advantest Corporation, Tokyo, Japan

Filed Oct. 18, 1994, Ser. No. 324,684

Claims priority, application Japan, Jan. 18, 1993, 5-061023 U

Int. Cl.[6] H03K *5/135*

U.S. Cl. 327—286 **1 Claim**



1. A timing generator used in a semiconductor testing apparatus for generating delay timing signals which delay up to n-times of a period of a reference clock, comprising:

a counter for counting the reference clock:

an adder for adding the output of said counter to delay data;

a series of registers for storing the output of said adder and shifting said output of said adder in synchronism with a delay trigger signal;

a series of exclusive OR gates for comparing each output of said registers with the output of said counter and generating coincidence signals when said output from said register and said counter coincide with each other; and

an OR gate for receiving the outputs of said exclusive OR gates and generating a signal which is combined of said outputs from said exclusive OR gates.

5,488,326

DATA OUTPUT CIRCUIT FOR SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE WHICH PREVENTS CURRENT FLOW FROM THE OUTPUT TO SUPPLY VOLTAGE

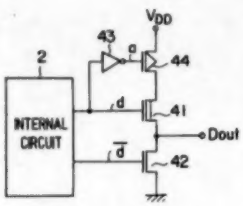
Sumako Shiraishi, Kawasaki; Masami Masuda, and Kazutaka Nogami, both of Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Apr. 6, 1994, Ser. No. 223,648

Claims priority, application Japan, Apr. 7, 1993, 5-080867

Int. Cl.[6] H03K *19/0185;17/687*

U.S. Cl. 327—408 **3 Claims**



1. A data output circuit, comprising:

an internal circuit for outputting a first drive signal and a second drive signal;

a P-channel transistor having a first end connected to a first supply voltage terminal and a gate receiving a signal obtained by inverting the first drive signal;

a first N-channel transistor having a first end connected to a second end of said P-channel transistor, a second end connected to an external output terminal, and a gate receiving the first drive signal; and

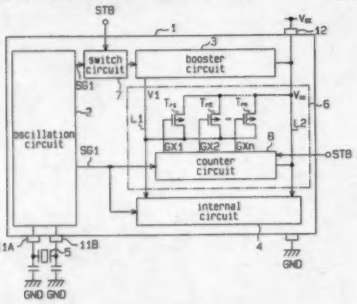
a second N-channel transistor having a first end connected to the external output terminal, a second end connected to a second supply voltage terminal, and a gate receiving the second drive signal,

wherein a threshold voltage of said first N-channel transistor is lower than that of said second N-channel transistor, and when the first drive signal becomes high level and the second drive signal becomes low level, said P-channel transistor and said first N-channel transistor are turned on and said second N-channel transistor is turned off, so that a high-level voltage supplied from the first supply voltage terminal is outputted to the external output terminal through said P-channel transistor and said first N-channel transistor.

5,488,327
SUPPLY VOLTAGE GENERATOR

Masaki Okada, Kasugai, Japan, assignor to Fujitsu Limited, Kanagawa, and Fujitsu VLSI Limited, Aichi, both of, Japan

Filed Dec. 28, 1994, Ser. No. 365,432
Claims priority, application Japan, Dec. 28, 1993, 5-334973
Int. Cl.[6] G05F *1/10;3/02*
U.S. Cl. 327—536 **12 Claims**



1. A circuit for receiving a supply voltage from a power supply and generating an output voltage having a desired voltage level that is different from the supply voltage, said circuit comprising:

an oscillator for generating an oscillator output signal;

a supply voltage generator for generating an output voltage having a predetermined level that is different than said supply voltage in response to said oscillator output signal;

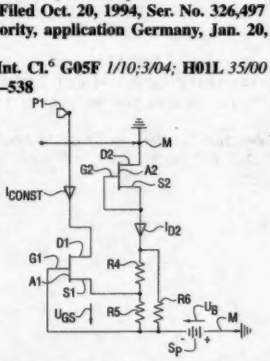
a first interconnection for connecting said supply voltage generator to a circuit to be supplied with said output voltage, said circuit being connected to the power supply via a second interconnection; and

a potential difference control circuit provided between said first interconnection and said second interconnection, the control circuit being responsive to said oscillator output signal to gradually reduce a potential difference between said first interconnection and said second interconnection in synchronism with a change in the output voltage.

5,488,328
CONSTANT CURRENT SOURCE

Michael Ludwig; Rolf Reber, both of Ulm, and Heinz-Peter Feldle, Senden, all of, Germany, assignors to Deutsche Aerospace AG, Munich, Germany

Filed Oct. 20, 1994, Ser. No. 326,497
Claims priority, application Germany, Jan. 20, 1993, 43 35 683.4
Int. Cl.[6] G05F *1/10;3/04;* **H01L** *35/00*
U.S. Cl. 327—538 **11 Claims**



1. A constant-current source with an adjustable constant current comprising, in combination:

first and second field effect transistors having the same electrical behavior, and in which the saturation current (I_{DSS}) is proportional to the pinch-off voltage (U_p), each field effect transistor having a respective source, drain and gate;

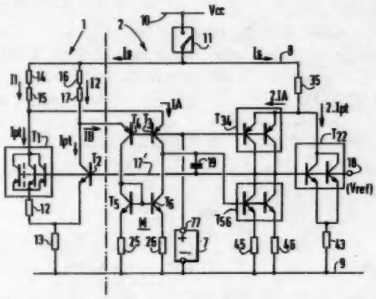
a voltage divider circuit including a series connection of said first field effect transistor, having its drain connected to one pole of a voltage source and which is connected as a current source with its source and gate connected together, and at least one ohmic resistance connected between said source of said first field effect transistor and the other pole of said voltage source; and,

said second field effect transistor has its gate connected to said other pole of said voltage source, its source connected to said resistance such that a portion of said resistance is present between its said gate and its said source and with said resistance portion being a function of the constant current (I_{const}) to be adjusted and which is to flow via said drain of said second field effect transistor to a component meant for the constant current (I_{const}) to be connected to said drain of said second field effect transistor.

5,488,329
STABILIZED VOLTAGE GENERATOR CIRCUIT OF THE BAND-GAP TYPE

Timothy Ridgers, Bretteville L'Orgueilleuse, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 7, 1994, Ser. No. 319,899
Claims priority, application France, Jan. 13, 1993, 93 12187
Int. Cl.[6] G05F *1/10*
U.S. Cl. 327—539 **9 Claims**



1. A voltage generator circuit comprising: a cell of the band-gap type, in which a plurality of m parallel-connected transistors form a compound first transistor of a first conductivity type, whose emitter is connected to one end of a first emitter resistor, an other end of said resistor being connected to an emitter of a second transistor of the same conductivity type whose emitter area is equal to an emitter area of one of the m transistors forming the compound first transistor, the second transistor having its base coupled to a base of the first transistor to form an output node, a first node between the emitter of the second transistor and the first emitter resistor being coupled to a first supply terminal via a second emitter resistor, an amplifier acting upon the base of the first and of the second transistor to assure equality of currents flowing through the first and the second transistor, respectively, wherein collectors of the first and second transistors are each coupled to a second supply terminal by a first and a second current source, respectively, supplying a current of the same value, wherein the amplifier has an input stage comprising two transistors of a second conductivity type opposite to that of the first and second transistors and having emitters, of equivalent area, connected to the collectors of the first and second transistors, respectively, having their bases interconnected and coupled to the first supply terminal via a circuit with a given voltage drop, and having their collectors connected to, respectively, the input and the output of a current mirror of unity ratio, comprising transistors of said first conductivity type and having their emitters coupled to the first supply terminal, in that the amplifier comprises an output stage comprising an error-amplifier transistor of the first conductivity type, a bias transistor of the second conductivity type, and a compensation transistor of the first conductivity type, wherein the error-amplifier transistor has an

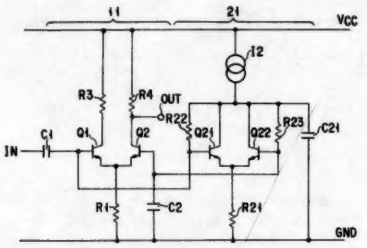
emitter area equal to twice an emitter area of each of the transistors forming the current mirror, a base connected to an output of the current mirror, its emitter coupled to the first supply terminal, and its collector connected to the output node which forms the output of the amplifier and supplies the stabilized output voltage (Vref) of the circuit, in that the bias transistor has an emitter area equivalent to that of the two transistors of the input stage together, has its emitter coupled to the second supply terminal via a third current source supplying a current equal in value to a sum of currents of the first and the second current source, has its base connected to the bases of the two transistors of the input stage, and has its collector connected to the output node, and in that the compensation transistor has an emitter area equal to twice that of the second transistor, has its base connected to the output node, has its emitter coupled to the first supply terminal via a resistor of a value equal to a resistance value of the second emitter resistor of the cell, and has its collector connected to the emitter of the bias transistor.

5,488,330

BIAS CIRCUIT FOR CONTROLLING BIAS VOLTAGE OF DIFFERENTIAL AMPLIFIER

Hideaki Masuoka, Yokohama, and Akio Kuroda, Atsugi, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 22, 1994, Ser. No. 361,583
Claims priority, application Japan, Dec. 22, 1993, 5-323480
Int. Cl.[6] H03F *3/45;* H04B *1/26*
U.S. Cl. 330—261 **15 Claims**



1. A bias circuit of a differential amplifier, comprising:

first and second transistors constituting a first differential amplifier and each having a current path one end of which is grounded via a resistor and another end of which is connected to a power source, said first transistor having a base supplied with an input signal;

third and fourth transistors constituting a second differential amplifier and each having a current path one end of which is grounded via a resistor, said third transistor having a base connected to the base of said first transistor, and said fourth transistor having a base connected to a base of said second transistor;

a constant-current source connected between said power source and another end of the current path of each of said third and fourth transistors, said constant-current source supplying a constant current to said third and fourth transistors; and

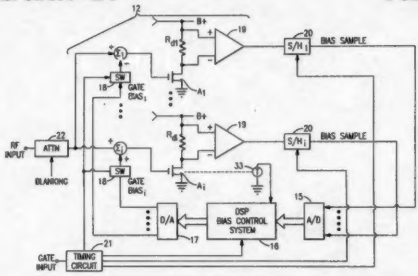
a capacitor one end of which is connected to a connection node between said constant-current source and said another end of the current path of each of said third and fourth transistors, and another end of which is grounded, said capacitor being discharged when a high-level signal is input to the bases of said first and third transistors, thereby to drop a base potential of said first and second transistors.

5,488,331

ACTIVE BIAS FOR A PULSED POWER AMPLIFIER

Anthony R. A. Keane, Webster, and Bart C. Vandebroek, Penfield, both of N.Y., assignors to ENI, A Div. of Astec America, Inc., Rochester, N.Y.

Continuation of Ser. No. 243,161, May 16, 1994. This application Apr. 7, 1995, Ser. No. 418,182
Int. Cl.[6] H03G *3/30*
U.S. Cl. 330—296 **1 Claim**



1. A bias control circuit for adjusting an input bias voltage for each of a plurality of amplifying devices comprising:

a digital control circuit for converting a plurality of analog output current bias signals into a plurality of equivalent digital output current bias signals, for generating a plurality of digital input bias levels for each one of the amplifying devices based on the associated digital output current bias signal from each of the amplifying devices, and for converting the digital input bias levels into a plurality of equivalent analog input bias levels;

a plurality of bias current sample means, each one of said bias current sample means being associated with one of the amplifying devices for periodically gating the analog output current bias signal to said digital control circuit;

a plurality of input bias means, each one of said bias means being associated with one of the amplifying devices for periodically biasing an input with the associated analog input bias level generated by said digital control circuit, whereby the amplifying devices are maintained at a desired operating point; and

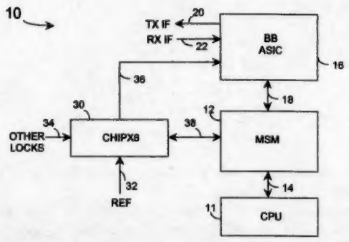
a timing circuit means for periodically gating said digital control circuit, said plurality of bias current sample means, and said plurality of input bias means.

5,488,332

REVERSED PHASE-LOCKED LOOP

John P. De Loe, Jr., Decatur, Ga., assignor to Oki Telecom, Suwanee, Ga.

Filed Jun. 10, 1994, Ser. No. 258,347
Int. Cl.[6] H03L *7/08;7/085;7/18*
U.S. Cl. 331—25 **31 Claims**



1. A phase-locked loop circuit comprising:

means responsive to a control signal for oscillating to produce a loop signal at a first frequency with a phase controlled by said control signal;

means connected to said oscillating means responsive to said loop signal and a reference signal for generating said control signal and for buffering said loop signal to produce a controlled buffered output signal; and

means for selectively grounding said loop signal to reduce power consumption of said generating buffering means.

5,488,333

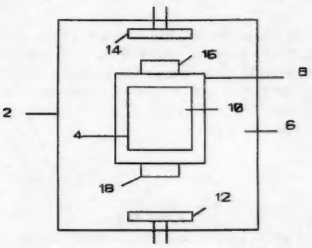
WIRELESS THERMALLY INSULATED CRYSTAL OSCILLATOR HAVING POWER AND SIGNALS COUPLED THROUGH TRANSCEIVERS

John R. Vig, Colts Neck, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 7, 1995, Ser. No. 418,979

Int. Cl.[6] H03B *5/32;* **H03L** *1/04*

U.S. Cl. 331—66 **20 Claims**



1. A wireless oscillator device which comprises an oscillator, first wireless transceiver means cooperating with the oscillator and being capable of wireless reception of power and wireless reception and transmission of signals through a thermally insulating medium; said oscillator and first wireless transceiver means being in an enclosure and surrounded on all sides with a thermally insulating medium sufficient to provide thermal insulation of the oscillator from ambient surroundings; and second wireless transceiver means positioned spaced from the first wireless transceiver means and being capable of the wireless transmission of power and wireless reception and transmission of signals through the thermally insulating medium to the first wireless transceiver means.

5,488,334

AIR-COOLED POWER LOAD

Ivan Wolk, Arnouville les Gonesse, France, assignor to Thomcast, Conflans Ste Honorine, France

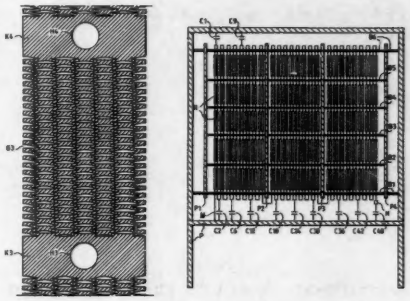
Filed Apr. 6, 1995, Ser. No. 417,767

Claims priority, application France, Apr. 8, 1994, 94 04169

Int. Cl.[6] H01P *1/26;* **H01C** *3/12*

U.S. Cl. 333—22 F **6 Claims**

1. An air-cooled power load usable in radiofrequencies, comprising a series-connected assembly of resistor modules, each of these modules being substantially plane, made of expanded metal and having two ends, a metal support structure, insulator elements to hold the assembly and frequency compensation means, these compensation means comprising capacitive links, each of the capacitive links connecting one of the ends of one among certain of the modules to the support structure.



5,488,335

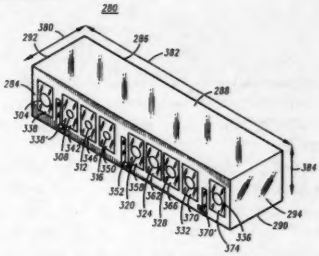
MULTI-PASSBAND DIELECTRIC FILTER CONSTRUCTION HAVING A FILTER PORTION INCLUDING AT LEAST A PAIR OF DISSIMILARLY-SIZED RESONATORS

Darioush Agahi-Kesheh, Buffalo Grove; Zdravko M. Zakman, Schaumburg, and Robert Kenoun, Prospect Heights, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 888,089, May 26, 1992, abandoned, which is a continuation-in-part of Ser. No. 823,227, Jan. 21, 1992, Pat. No. 5,208,566, and Ser. No. 876,607, Apr. 30, 1992, Pat. No. 5,250,916. This application Oct. 12, 1994, Ser. No. 322,118

Int. Cl.[6] H01P *1/20*

U.S. Cl. 333—206 **24 Claims**



1. A multi-passband filter construction formed of a dielectric block defining top, bottom, and at least first and second side surfaces, said surfaces being metalized, said filter construction comprising:

a first filter circuit portion formed of a first portion of the dielectric block for generating a first filtered signal responsive to application of a first input signal thereto, the first filter circuit portion having at least two resonators, each of the at least two resonators being defined by metalized sidewalls of cavities formed to extend essentially longitudinally along longitudinal axes thereof between the top and bottom surfaces of the dielectric block, wherein a first of the at least two resonators is of a first cross-sectional area of a predetermined configuration and a second of the at least two resonators is of a second cross-sectional area of the same predetermined configuration wherein the first cross-sectional area is dissimilar in area with that of the second cross-sectional area; and

a second filter circuit portion formed of a second portion of the dielectric block located adjacent to the first portion of the dielectric block of which the first filter circuit is formed, said second filter circuit portion for generating a second filtered signal responsive to application of a second input signal thereto, the second filter circuit portion having at least one resonator defined by metalized sidewalls of at least one cavity

formed to extend essentially longitudinally along a longitudinal axis thereof between the top and bottom surfaces of the dielectric block.

5,488,336

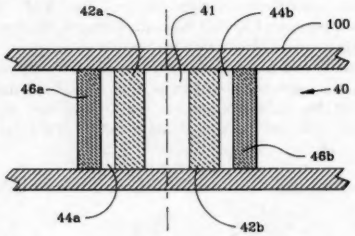
BROADBAND WAVEGUIDE PRESSURE WINDOW

David F. Rivera, Westerly, R.I.; Thomas R. Floyd, Waterford, and Michael J. Josypenko, Norwich, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 8, 1994, Ser. No. 287,026

Int. Cl.[6] H01P *1/08*

U.S. Cl. 333—252 **3 Claims**



1. A broad passband pressure barrier arrangement for insertion in a circular waveguide between a source and a receiver of radio frequency (RF) energy with a spatially circumferential electric field, comprising:

a solid cylindrical plug region pair sealed in a cross-section of the waveguide for blocking the passage of a predetermined pressure load, the diameter of said plug region pair being equal to the inside diameter of said waveguide, said plug region pair centered on a radial plane of the waveguide, said radial plane passing through free air, said plug region pair consisting of identically sized cylindrical plugs formed of a dielectric material having a unique permittivity, said identical cylindrical plugs having a unique longitudinal thickness;

at least one solid cylindrical barrier region pair sealed in said cross-section of the waveguide, the diameter of said at least one barrier region pair being equal to the inside diameter of said waveguide, said at least one barrier region pair centered on and disposed symmetrically about said radial plane, said plug region pair being disposed between said radial plane and said at least one barrier region pair, said at least one barrier region pair consisting of identically sized cylindrical barriers formed of a dielectric material having a unique permittivity, said identical cylindrical barriers having a unique longitudinal thickness;

each of said plugs and barriers defined by a characteristic impedance at opposing end faces thereof and by a characteristic impedance between said opposing end faces; and

each permittivity and longitudinal thickness being optimized across the passband so that an input impedance of the barrier arrangement as seen from the source is equal to a characteristic impedance of the circular waveguide.

5,488,337

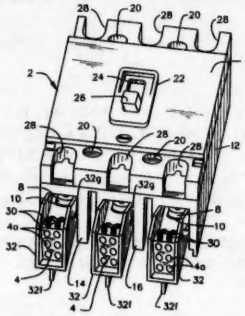
CIRCUIT BREAKER WITH DISTRIBUTION LUG TERMINAL HAVING TRAPPED INSULATOR

Dean A. Hubbard, N70 W23395 Prides Rd., Sussex, Wis. 53089; Donald A. Link, 1155 Hubertus, Hubertus, Wis. 53033, and David S. Hunter, 11907 W. Appleton Ave., Milwaukee, Wis. 53224

Filed Aug. 5, 1993, Ser. No. 102,190

Int. Cl.[6] H01H *67/02*

U.S. Cl. 335—202 **24 Claims**



1. A molded case circuit breaker comprising a molded case, a terminal and a wiring lug attached to said terminal, said lug projecting outwardly from said circuit breaker molded case, and an insulator discrete from said molded case disposed around said lug and trapped into said circuit breaker molded case by attachment of said lug to said terminal.

5,488,338

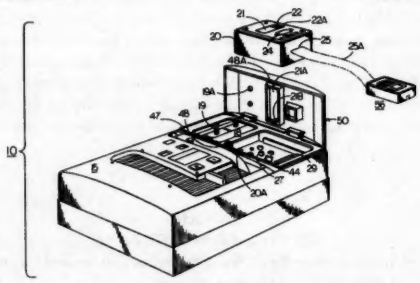
ELECTRONIC TRIP ASSEMBLY FOR HIGH AMPERE-RATED CIRCUIT BREAKER

Raymond K. Seymour; Paul T. Rajotte, both of Plainville, and Elaine B. Bogue, Stonington, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed May 25, 1994, Ser. No. 248,908

Int. Cl.[6] H01M *9/02*

U.S. Cl. 335—202 **19 Claims**



1. An industrial-rated circuit breaker for high level overcurrent protection comprising:

an insulative circuit breaker cover **15** arranged on an insulative base **11**;

an electronic trip unit **20** within a trip unit recess **20A** in said circuit breaker cover for interrupting circuit current upon occurrence of an overcurrent condition, said trip unit including a keypad **22** and display **21** for entering and displaying overcurrent set points, said trip unit defining a trip unit cover **37** attached to a trip unit case **36**, said keypad and display being arranged under said trip unit cover; and

an additional trip unit cover **50** hinged to said circuit breaker cover, said additional trip unit cover including an access slot

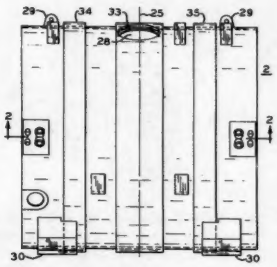
21A over said keypad and display, said access slot including means for preventing access to an entry key 22A on said keypad.

5,488,339

PASSIVE SHIELDING OF MOBILE MAGNETIC RESONANCE IMAGING MAGNET

Timothy J. Havens; Yulan Tan, and John Scaturro, Jr., all of Florence, S.C., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 23, 1993, Ser. No. 156,605
Int. Cl.[6] H01F *1/00*
U.S. Cl. 335—216 **18 Claims**



1. A passive magnetic field shielding system for a magnetic resonance imaging magnet including an outer vessel and superconducting magnet coils within an inner vessel and capable of transportation while in superconducting operation comprising:

a plurality of arcuate ferromagnetic shielding bands surrounding and spaced along the axis of said magnetic resonance imaging magnet;

at least some of said arcuate bands being secured about said outer vessel proximate to areas of maximum magnetization of said outer vessel in the absence of said bands; and

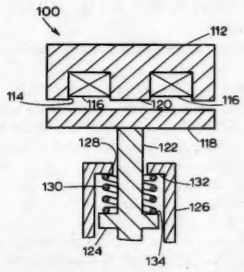
said ferromagnetic shielding bands covering a minor portion of the axial length of said magnetic resonance imaging magnet.

5,488,340

HARD MAGNETIC VALVE ACTUATOR ADAPTED FOR A FUEL INJECTOR

Dale C. Maley, Fairbury, and Dwayne E. Tharp, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed May 20, 1994, Ser. No. 247,150
Int. Cl.[6] H01F *7/08*
U.S. Cl. 335—253 **22 Claims**



1. A solenoid actuator having a pole member and an armature associated therewith, said solenoid actuator being latchable by residual magnetism between said pole member and said armature without the aid of a permanent magnet, said solenoid actuator comprising:

a pole member comprising steel having a carbon content of between about 0.8% and 1.2% and an RC hardness of between about 40 and 60;

an electrically energizable electromagnetic device associated with said pole member; and

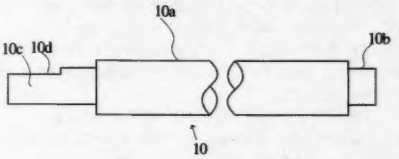
an armature associated with said pole member and comprising steel having a carbon content of between about 0.8% and 1.2% and an RC hardness of between about 40 and 60, said armature being reciprocable between a first position in which said armature makes physical contact with said pole member and a second position in which said armature is spaced from said pole member, said armature occupying said first position upon said electromagnetic device being electrically energized, said armature being held in said first position by residual magnetism between said pole member and said armature when said electromagnetic device is electrically deenergized after being initially electrically energized.

5,488,341

PERMANENT MAGNET MEMBER AND METHOD OF PRODUCING SAME

Mikio Yamamoto, Fukaya; Keitaro Yamashita, Saitama, and Katsunobu Kiriyama, Kumagaya, all of, Japan, assignors to Hitachi Metals, Ltd., Japan

Filed Jun. 6, 1994, Ser. No. 254,877
Claims priority, application Japan, Jun. 8, 1993, 5-137153
Int. Cl.[6] H01F *7/02;3/00;* G03G *15/09*
U.S. Cl. 335—302 **12 Claims**



1. A permanent magnet member comprising an integral sintered body made of a ferrite magnet material, said integral sintered body including a cylindrical center portion and shaft portions formed at the opposite ends of said cylindrical center portion and each having a smaller diameter than that of the cylindrical center portion, said cylindrical center portion being provided with a plurality of magnetic poles extending axially and arranged circumferentially on an outer surface of said cylindrical center portion.

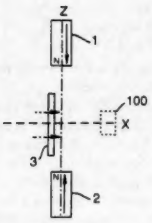
5,488,342

MAGNET ASSEMBLY FOR NMR

Peter Hanley, Forest of Dean, United Kingdom, assignor to Oxford Instruments Limited, Oxford, United Kingdom

PCT No. PCT/GB94/00226, § 371 Date Oct. 12, 1994, § 102(e) Date Oct. 12, 1994, PCT Pub. No. WO94/18577, PCT Pub. Date Aug. 18, 1994
PCT Filed Feb. 7, 1994, Ser. No. 318,824
Claims priority, application United Kingdom, Feb. 12, 1993, 9302837
Int. Cl.[6] G01V *3/00;* G01R *33/20;* H01F *7/02*
U.S. Cl. 335—306 **19 Claims**

1. A magnet assembly comprising a pair of substantially aligned, spaced apart first magnets having like poles facing each other; and at least one second magnet positioned adjacent the space between the first magnets, the at least one second magnet being laterally offset from the alignment axis of the first magnet and being arranged asymmetrically with respect to said alignment axis, the at least one second magnet having a magnetic axis transverse to the alignment axis of the first magnet; whereby a magnetic field of sufficient homogeneity to perform a nuclear magnetic resonance (NMR) process is generated in a working region laterally offset



from the first and second magnets, the magnetic field being asymmetrically positioned with respect to the alignment axis of the first magnets.

5,488,343

HIGH-TENSION CURRENT TRANSFORMER, WITH STORAGE PRODUCTION BY MEANS OF THE AUTOMATIZATION OF THE INSULATION THEREOF

Mario A. Taddei, via Paolo Frisi, 24, Rome, Italy

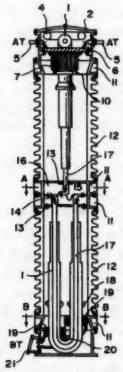
PCT No. PCT/IT92/00041, § 371 Date Nov. 2, 1993, § 102(e) Date Nov. 2, 1993, PCT Pub. No. WO93/18529, PCT Pub. Date Sep. 16, 1993

PCT Filed Apr. 14, 1992, Ser. No. 140,117

Claims priority, application Italy, Mar. 4, 1992, RM92A0143

Int. Cl.[6] H01F *27/28;15/04*

U.S. Cl. 336—229 **16 Claims**



1. A transformer comprising:

a primary core with a primary winding wrapped thereon;

at least one secondary core with a secondary winding wrapped thereon; and

an insulated connection winding for electrically connecting the primary winding with the secondary winding, the connection winding having an upper U-shaped portion and a lower U-shaped portion, the primary core being located at the upper U-shaped portion and the at least one secondary core being located at the lower U-shaped portion of the connection winding.

5,488,344

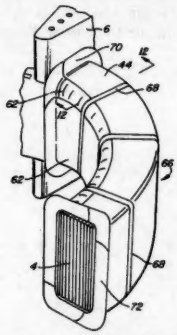
TOROIDAL TRANSFORMER INSULATION PREFORMS

Philip I. Bisbee, 527 Meadow La., Versailles, Ky. 40383; James D. Richerson, 534 Sheffield Dr., Versailles, Ky. 40383; Stephen D. Smith, 107 Shady La., Lawrenceburg, Ky. 40342, and Eric S. Richardson, 300 Scotts Ferry Rd. East, Versailles, Ky. 40383

Filed Nov. 3, 1992, Ser. No. 971,000

Int. Cl.[6] H01F *27/32*

U.S. Cl. 336—206 **25 Claims**



1. A transformer insulation assembly, for insulating one layer of windings from an adjacent layer of winding, comprising a tubular member defining a central axis and having an outer wall that defines a central opening extending the length of said member, said outer wall being formed by preformed sections of electrical insulating material, said preformed sections having overlapping surfaces that are slidably positioned relative to one another such that the extent of said surfaces that overlap can be changed to vary the size of said opening, each preformed section comprising a plurality of sheets of stretchable material, each preformed section including at least two side walls and a corner that forms a junction therebetween said corner extending generally parallel to the center axis of said tubular member and having a substantially uniform thickness along its length, the thickness of said corner being substantially greater than the average thickness of said side walls.

5,488,345

DISCONNECTION MECHANISM FOR A DARK CURRENT FUSE

Yoshinobu Seki; Kenichiro Kawaguchi; Gen Oozono; Akio Sugiyama, and Ryuetsu Oikawa, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Jul. 1, 1994, Ser. No. 269,674

Claims priority, application Japan, Jul. 2, 1993, 5-164368; Jan. 19, 1993, 5-260567; Feb. 2, 1994, 6-010830

Int. Cl.[6] H01H *85/02;85/52;* **H01R** *13/64;13/68*

U.S. Cl. 337—186 **4 Claims**

1. A disconnection mechanism for a dark current fuse, comprising:

a connecting terminal connecting the dark current fuse;

a fuse block body receiving said connecting terminal;

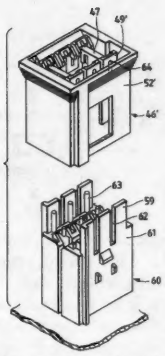
a fuse holder slidably engaged with said fuse block body in a direction of connecting the dark current fuse; and

a pair of flexible engaging arms disposed inside said fuse holder opposite to each other, each of said flexible engaging arms including an engaging projection for engaging a head of the dark current fuse, wherein said fuse block body includes an ingress wall portion for entering an arm deflection space between an inner side wall of said fuse holder and said flexible engaging arms.

3. A disconnection mechanism for a dark current fuse, comprising:

a connecting terminal connecting the dark current fuse;

a fuse block body receiving said connecting terminal;



a fuse holder slidably engaged with said fuse block body in a direction of connecting the dark current fuse;

a pair of flexible engaging arms disposed inside said fuse holder opposite to each other, each of said flexible engaging arms including an engaging projection for engaging a head of the dark current fuse; and

a pair of contact projections respectively disposed and inclined at a side of said engaging projections of said respective flexible engaging arms and being connected thereto, said contact projections projecting beyond said engaging projections, wherein a tool is insertable into said fuse holder for grasping and removing said fuse, said tool contacting said contact projections so as to deflect said contact projections and, attendantly, said engaging arms away from said fuse so that said fuse is disengaged from said fuse holder.

5,488,346

CONNECTION TERMINAL FOR FUSE

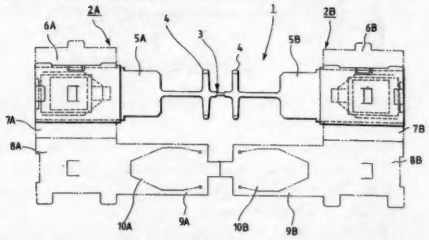
Hiroki Kondo; Mitsuhiko Totsuka, and Toshiharu Kudo, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Jun. 21, 1994, Ser. No. 262,865

Claims priority, application Japan, Jun. 21, 1993, 5-172050

Int. Cl.[6] H01H *85/02;85/52;69/02;* **H01R** *4/48*

U.S. Cl. 337—198 **2 Claims**



1. A connection terminal for a fuse comprising:

a unitary structure including a pair of connection members interconnected through a fusion portion, each of said connection members including a bottom plate, opposite side plates formed respectively on opposite sides of said bottom plate, a top plate extended continuously from one of opposite side plates and a spring member disposed within the top plate and extending from a front side thereof so as to hold a terminal between said spring portion and said bottom plate.

5,488,347

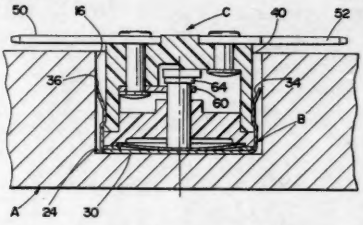
THERMOSTAT ASSEMBLY WITH FLANGED DISC CUP

Michael T. Gurski, Mansfield, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed May 31, 1994, Ser. No. 251,117

Int. Cl.[6] H01H *37/04;37/36;37/54;* **G05D** *23/10*

U.S. Cl. 337—380 **14 Claims**



1. A thermostat assembly including a switch housing having a metal disc cup attached thereto, said disc cup having a substantially flat circular cup bottom wall and a cylindrical peripheral wall, an inclined flange extending outwardly from said peripheral wall and upwardly in a direction away from said bottom wall, said flange having a sharp terminal end that faces outwardly away from said bottom wall, said terminal end having a larger diameter than any other portion of said disc cup and said flange having a sufficient length and being free of engagement with said switch housing or with any other part of said thermostat assembly for allowing inward bending deformation thereof without interference from any part of said thermostat assembly.

5,488,348

PTC THERMISTOR

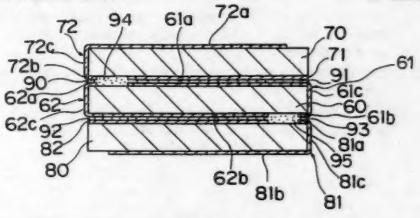
Shyoji Asida; Haruo Takahata, and Takayo Katsuki, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 8, 1994, Ser. No. 207,754

Claims priority, application Japan, Mar. 9, 1993, 5-009823 U; Mar. 15, 1993, 5-053458

Int. Cl.[6] H01C *7/10;1/14*

U.S. Cl. 338—22 R **18 Claims**



1. A PTC thermistor comprising:

a ceramic body having a positive temperature coefficient of resistivity and a pair of major surfaces that are on opposite sides of said ceramic body;

a pair of electrode layers provided on both major surfaces of the ceramic body, respectively, so as to be opposed to each other with said ceramic body interposed therebetween;

a ceramic reinforcing plate provided on at least one major surface of said ceramic body, and having an inner major surface and an outer major surface; and

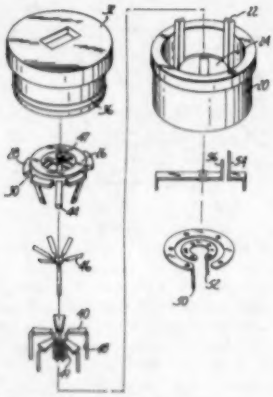
an input/output electrode having a connecting portion for making electrical connection with one of said electrode layers, said connecting portion being disposed on said inner major surface of said ceramic reinforcing plate and said input/output electrode including a portion that extends to said outer major surface of the ceramic reinforcing plate from the connecting portion.

5,488,349

MULTIPLE RANGE VARIABLE RESISTOR

Bruce L. Erickson, 11732 Winnetka Ave., North, Champlin, Minn. 55316

Filed Dec. 2, 1993, Ser. No. 161,656
Int. Cl.[6] H01C *10/32*
U.S. Cl. 338—171 **19 Claims**



1. A variable resistor comprising:

a housing;

a plurality of elongated resistive elements affixed to said housing, said resistive elements each having a first end and a second end;

means for connecting the first ends of each of said resistive elements to an electrical circuit;

means for selectably connecting the second ends of each of said resistive elements to an electrical circuit;

a plurality of contacts which can be moved between the end portions of said resistive elements while maintaining electrical connection with the surfaces of said resistive elements;

means for connecting said contacts to an electrical circuit;

means for moving said contacts between the first and second ends of said resistive elements comprised of:

a rotatable portion having threads;

a non-rotatable portion having corresponding threads, said non-rotatable portion disposed to move linearly along the axis of rotation of said rotaatable portion in response to rotation thereof;

means for connecting said contacts to said non-rotatable portion and;

retaining means for retaining said rotatable portion proximate to said housing and said resistive elements.

5,488,350

DIAMOND FILM STRUCTURES AND METHODS RELATED TO SAME

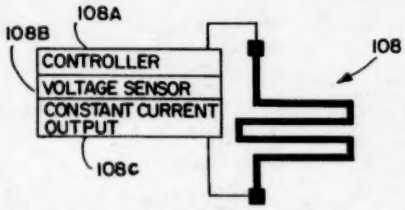
Mohammad Aslam, and James V. Beck, both of Okemos, Mich., assignors to Michigan State University, East Lansing, Mich.

Filed Jan. 7, 1994, Ser. No. 178,784
Int. Cl.[6] H01L *21/265*
U.S. Cl. 338—225 D **11 Claims**

1. A method of heating and sensing temperature comprising steps of:

providing a substrate including a surface and a temperature-sensitive structure attached to said surface, said temperature-sensitive structure including an electrically conductive diamond film having an electrical resistivity that characteristically changes in response to temperature change;

applying an electrical source having a voltage to said temperature-sensitive structure in order to induce a current



through said conductive diamond film to thereby heat said temperature-sensitive structure and the substrate surface to an elevated operating temperature; and

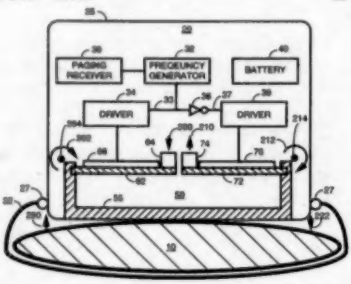
determining one of an actual temperature and a relative temperature change based on said characteristic electrical resistivity of said conductive diamond film by sensing a change in one or both of said voltage and said current.

5,488,351

ROCKING VIBRATOR ALERT APPARATUS DRIVEN BY OPPOSITE PHASES OF A FREQUENCY GENERATOR

Mostafa Hedayatnia, and Margaret Graham-Meighan, both of Boynton Beach, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 2, 1993, Ser. No. 100,813
Int. Cl.[6] H04Q *1/30*
U.S. Cl. 340—407.1 **11 Claims**



1. A vibrator for generating a vibratory alert, the vibrator comprising:

a first vibrating member oscillating at a first frequency and at a first phase and producing a first oscillating moment upon a housing, the first oscillating moment having a first magnitude orientated along a first axis; and

a second vibrating member oscillating at the first frequency and at a second phase and producing a second oscillating moment upon the housing, the second oscillating moment having a second magnitude orientated along a second axis, wherein

the second phase is substantially inverted from the first phase,

the second axis is substantially parallel to the first axis, and

the first oscillating moment and the second oscillating moment combine to produce a total oscillating moment having a magnitude greater than either the first magnitude or the second magnitude.

5,488,352

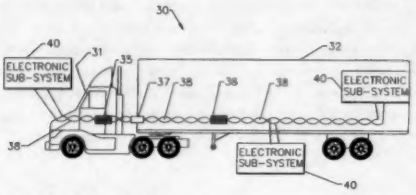
COMMUNICATIONS AND CONTROL SYSTEM FOR TRACTOR/TRAILER AND ASSOCIATED METHOD

Kenneth O. Jasper, Charlotte, N.C., assignor to Vehicle Enhancement Systems, Inc., Rockhill, S.C.

Continuation-in-part of Ser. No. 899,617, Jun. 16, 1992, abandoned. This application Nov. 1, 1993, Ser. No. 147,043

Int. Cl.[6] G08B *21/00*

U.S. Cl. 340—431 60 Claims



1. A vehicle comprising:

a tractor and a trailer connected thereto;

a plurality of electrical conductors extending between said tractor and said trailer;

a connector electrically connected in series with said plurality of electrical conductors, said connector including disengageable first and second connector portions to facilitate disconnecting said tractor and said trailer, a plurality of electrically conducting pins carried by said first connector portion, and mating electrically conductive contacts carried by said second connector portion;

first and second controllers carried by said tractor and said trailer respectively; and

a communications channel interconnecting said first and second controllers, said communications channel comprising inductive coupling means carried by said connector for inductively coupling thereacross, said inductive coupling means comprising first and second portions inductively coupled together and respectively carried by said disengageable first and second connector portions of said connector.

5,488,353

APPARATUS AND METHOD FOR IMPROVING THE AWARENESS OF VEHICLE DRIVERS

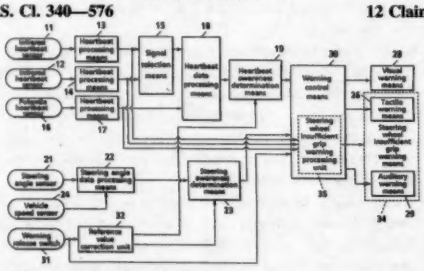
Yoshinaka Kawakami, Kariya; Yoshiharu Takigawa, Okazaki; Arihiro Isomura, Kariya; Kouichi Kamiya, Anjo, and Katsunori Hamatani, Okazaki, all of, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 4, 1994, Ser. No. 177,863

Claims priority, application Japan, Jan. 6, 1993, 5-000785

Int. Cl.[6] G08B *23/00*

U.S. Cl. 340—576 12 Claims



1. An apparatus comprising:

awareness determination means for determining a level of awareness of a vehicle driver and comparing the level of awareness with a reference value to determine a decrease in awareness,

at least one warning means for generating a warning to the vehicle driver when the decrease in awareness is detected,

warning termination means for terminating the warning upon operation by the vehicle driver, and

reference value correction means for measuring a response time from the generation to the termination of said warning and for correcting the reference value of said awareness determination means according to said response time for subsequent comparison and warning generation.

5,488,354

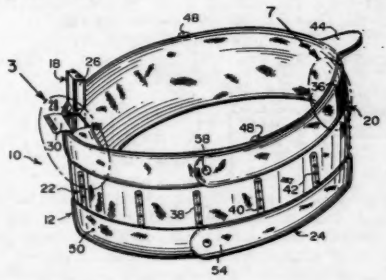
SNOOZE ALERT DEVICE

Colvin Bobby, 308 23rd St. North, Columbus, Miss. 39701

Filed Dec. 2, 1994, Ser. No. 349,017

Int. Cl.[6] G08B *21/00*

U.S. Cl. 340—576 9 Claims



1. A snooze alert device comprising:

a) a flexible collar to be worn about a neck of a person, said flexible collar including a pair of adjustable connector straps, so that said flexible collar can properly fit about different sized necks;

b) a portable power source carried in said flexible collar, said portable power source being a battery;

c) an audible alarm unit carried in said flexible collar;

d) a plurality of alarm actuating switches disposed about the periphery of said collar, each said alarm actuating switch electrically connected between said portable power source and said audible alarm unit, so that if the person tries to fall asleep and tilts the neck, said flexible collar will collapse and one said alarm actuating switch will close, causing said audible alarm unit to sound off and wake up the person;

e) a holder pocket to retain said battery therein; and

f) a flap over said holder pocket to seal said battery within said holder pocket.

5,488,355

INTEGRATED SPECTRAL FLAME MONITOR

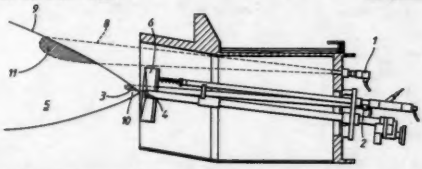
David Tindall, and Malcolm Sarjeant, both of Berkshire, England, assignors to Spectus Limited, Berkshire, England

Filed Oct. 17, 1994, Ser. No. 325,109

Claims priority, application United Kingdom, Jan. 22, 1993, 9321810

Int. Cl.[6] G08B *17/12*

U.S. Cl. 340—578 10 Claims



1. An oil flame monitor, comprising:

(a) a first flame detector for viewing a first region of a flame produced by an oil atomizer,

(b) a second flame detector for viewing a second region of the same flame,

(c) said first and second flame detectors monitoring different characteristics of the flame for deriving qualitative information about the flame, and

(d) means for processing the outputs of said first and second flame detectors to provide information about the position of the flame front and the quality of the flame.

5,488,356

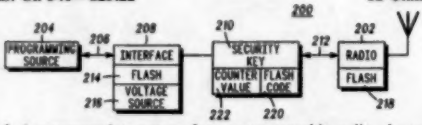
METHOD AND APPARATUS FOR SECURE PROGRAMMING OF COMMUNICATION RADIOS

Krsman Martinovich, 52 N. Walnut Ct., Streamwood, Ill. 60107, and Donald R. Beyer, 310 Terrace Dr., Bartlett, Ill. 60103

Filed Mar. 30, 1994, Ser. No. 220,128

Int. Cl.[6] H04Q *1/00*

U.S. Cl. 340—825.22 **12 Claims**



6. A programming system for a programmable radio, the programming system including a programming source, comprising:

first programmable memory means, residing in the programmable radio, for storing at least an operable feature set;

interface means for providing access to the programmable radio by the programming source, the interface means comprising second programmable memory means for storing operating software to be used by the programmable radio;

energy means for programming the first programmable memory means; and

a security key, operably coupled to the interface means, that retains at least an indication of the operable feature set.

5,488,357

REMOTE CONTROLLING METHOD AND SYSTEM FEATURE STARTING METHOD AND CONTROLLING METHOD FOR AUDIO/VISUAL SYSTEM

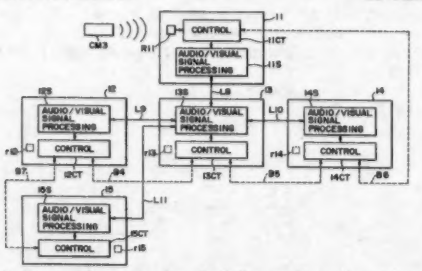
Makoto Sato; Hiroshi Yamazaki, both of Kanagawa; Noriko Kotabe, Chiba; Yoshio Osakabe, Kanagawa; Yasuo Kusagaya; Shigeo Tanaka, both of Tokyo; Kouich Sugiyama, and Akira Katsuyama, both of Kanagawa, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 21, 1993, Ser. No. 170,798

Claims priority, application Japan, Jan. 6, 1993, 5-016727; Jan. 12, 1993, 5-019578

Int. Cl.[6] H04Q *1/00*

U.S. Cl. 340—825.25 **12 Claims**



1. In a remote control method for an electronic equipment system which includes a plurality of units of electronic equipment each including a remote control reception center and a microcomputer for controlling operation of the respective electronic equipment, the microcomputers of said electronic equipment being connected to each other by way of a bus system, and at least one remote control transmission unit, the improvement comprising the steps of: providing an electronic center equipment to control said electronic equipment system in a concentrated manner; causing said electronic center equipment to receive at the respective remote control reception section remote control signals in a concentrated manner without causing the remote control signal reception sections of said electronic equipment other than said electronic center equipment to function; transferring a command from said electronic center equipment to said electronic equipment; and wherein, upon initialization when each unit of said electronic equipment is connected by way of said bus system, said electronic center equipment inhibits functioning of the respective remote control signal reception sections of the other units of electronic equipment.

5,488,358

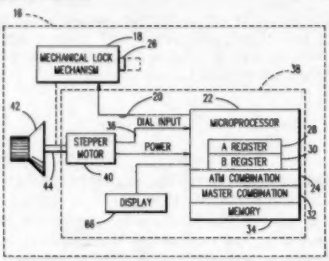
ELECTRONIC COMBINATION LOCK WITH CLOSURE AND LOCKING VERIFICATION

James E. Hamilton; Gerald L. Dawson, both of Lexington, and Daniel L. Thompson, Paris, all of Ky., assignors to Mas-Hamilton Group, Lexington, Ky.

Filed Feb. 18, 1994, Ser. No. 198,835

Int. Cl.[6] E05B *49/00*; G06F *7/04*; H04L *9/12*

U.S. Cl. 340—825.31 **11 Claims**



1. An electronic combination lock comprising:

a dial;

a generator connected to said dial for generating electrical power for powering said lock and for entering a first combination into said lock;

electronic controls comprising a program controlled microprocessor for receiving said first combination and said power and for comparing said first combination with an authorized combination and for controlling opening of said lock;

said electronic controls further comprising a memory for storing said combination and at least one additional multiple digit number associated with said lock;

said electronic controls further responsive to said dial and said electrical power to encrypt at least portions of two numerical values including said first combination and one of said at least one additional multiple digit numbers stored in said memory to produce an encrypted number upon powering of said lock;

a display responsive to said electronic controls to display said encrypted number;

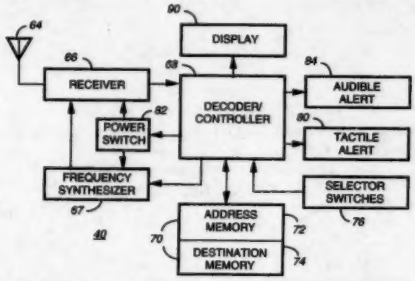
whereby said number may be observed and reported for comparison to a similarly encrypted number to verify said lock as locked.

5,488,359

METHOD AND APPARATUS FOR SETTING A MEMORY FULL CONDITION IN A SELECTIVE CALL RECEIVER

Randi W. Faris, Boca Raton, and Christopher Henz, Lake Worth, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 19, 1994, Ser. No. 308,851
Int. Cl.[6] H04Q 7/14
U.S. Cl. 340—825.44 16 Claims



1. A method for optimizing utilization of a memory which stores messages received in a portable communication device comprising steps of:

providing an adjustable memory full threshold for indicating a memory full condition of the memory;

receiving input from a user of the portable communication device for setting the adjustable memory full threshold;

determining an amount of space available in the memory of the portable communication device;

comparing the amount of space available in the memory with the adjustable memory full threshold;

issuing an indication of a memory full condition if the amount of space available in the memory is less than or equal to the adjustable memory full threshold;

receiving a new message in the portable communication device;

determining the amount of space available in the memory of the portable communication device in response to receiving the new message and determining a size of the new message;

deleting a previously stored message from the memory if the amount of space available in the memory is less than the size of the new message and storing the new message in the memory; and

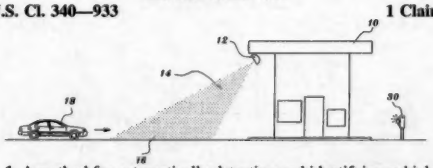
if the amount of space available in the memory is greater than or equal to the size of the new message, then storing the new message in the memory without deleting a previously stored message.

5,488,360

VEHICLE DETECTION AND IDENTIFICATION SYSTEM

Jimmy C. Ray, 3355 Juanita, Denison, Tex. 75020

Filed Aug. 29, 1994, Ser. No. 298,218
Int. Cl.[6] G08G 1/01
U.S. Cl. 340—933 1 Claim



1. A method for automatically detecting and identifying vehicles having cellular telephone equipment, comprising the following steps:

a) receiving a cellular-frequency signal from a vehicle to detect an approach of said vehicle to a restricted-access facility, said restricted-access facility including a toll-road booth, and said signal being received by an antenna having a restricted zone of transmission and reception,

b) receiving said signal by an antenna in which said restricted zone of reception is further limited by a downward orientation of said antenna, so that reception by said antenna is restricted to an area proximate said antenna,

c) transmitting a query to the cellular telephone equipment aboard the vehicle, said vehicle being within a vehicle identification zone,

d) transmitting responsive to said query an identification number from said cellular telephone equipment,

e) receiving said identification number by said antenna, including said identification number transmitted responsive to a command entered by a user of said cellular telephone equipment,

f) transmitting said identification number to a computer controller,

g) repeating, responsive to a request by said computer controller, a transmission of said identification number from a short-term memory to said computer controller,

h) processing said identification number within the computer controller to determine whether said identification number matches a number on a list of j) valid identification numbers,

transmitting a traffic-control command from the computer controller to said restricted-access facility,

k) activating by said traffic-control command a traffic control signal for a traffic lane through said restricted-access facility,

l) activating by said traffic-control command a visual signal for use by an operator of said restricted-access facility,

m) recording a predetermined user fee together with date and time-of-use information, and

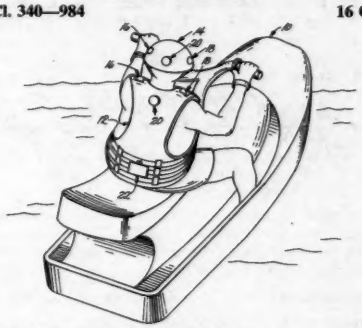
p) billing said user fee to a cellular telephone subscriber whose telephone number corresponds to said identification number.

5,488,361

NAVIGATION LIGHTS FOR PERSONAL WATERCRAFT OPERATOR

Joseph W. Perry, 1560 Amate, La Habra Heights, Calif. 90631

Filed Aug. 16, 1994, Ser. No. 291,604
Int. Cl.[6] G08B 23/00
U.S. Cl. 340—984 16 Claims



1. A navigation lights device comprising:

a buoyant vest adapted to be worn by a person on a personal watercraft;

a red colored navigation light attached to an upper left shoulder portion of the vest; and

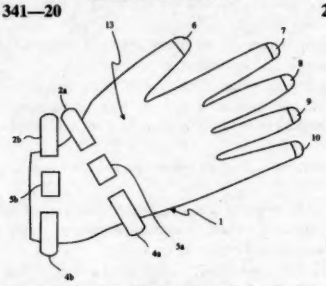
a green colored navigation light attached to an upper right shoulder portion of the vest; and

a white or clear colored navigation light attached to an upper back side surface of the vest between the first and second navigation lights, wherein an observer located behind a person wearing the vest is able to ascertain from the position of the navigation lights with respect to each other the direction of movement of the watercraft.

5,488,362
APPARATUS FOR CONTROLLING A VIDEO GAME

Noah T. Ullman, and Adam N. Ullman, both of Glen Cove, N.Y., assignors to Anaphase Unlimited, Inc., Glen Cove, N.Y.

Filed Oct. 1, 1993, Ser. No. 131,094
Int. Cl.[6] H03K 17/94
U.S. Cl. 341—20 20 Claims



1. An apparatus for providing command signals for controlling at least one video element on a video display, comprising:

a hand attachment;

a plurality of detectors disposed at spaced apart locations of said hand attachment for detecting directional movement;

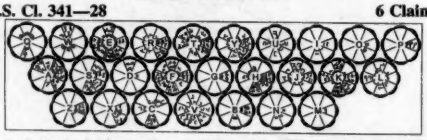
each of said plurality of detectors for detecting a specific relative directional movement of an arm and hand thereof in a plane relative to said arm; and

means for converting said detected movement to command signals for controlling the movement of said at least one video element in directions corresponding to said relative movement on said video display.

5,488,363
DIRECTION CODE FOR ENCODING CHINESE CHARACTERS USING ENGLISH ALPHABET AND INPUTTING METHOD THEREOF

Jingmin Peng, 18 Dagaoshan Road, Chengnan, Changde City, Hunan Province, China

Filed Feb. 9, 1994, Ser. No. 195,342
Claims priority, application China, Mar. 3, 1993, 93 1 10607.9; Aug. 30, 1993, 93 1 16696.9; Dec. 15, 1993, 93 1 20028.8
Int. Cl.[6] H03K 17/94
U.S. Cl. 341—28 6 Claims



1. A method of encoding and inputting Chinese characters into computers, through a standard English keyboard, each Chinese character being composed of one or more strokes written in an order of traditional Chinese calligraphy wherein initial strokes are classified into four types of horizontal stroke —, vertical stroke |, left-slanting stroke ノ, and right-slanting stroke 乀, said method comprising the steps of:

(A) constructing predetermined English letters with the initial strokes;

(B) decomposing Chinese characters into combinations of the predetermined English letters and inverted English letters which are respectively allocated on each key of the keyboard in eight positional directions of EAST, SOUTHEAST, SOUTH, SOUTHWEST, WEST, NORTHWEST, NORTH, and NORTHEAST, and posted respectively thereon as being spun about the center of the key, said predetermined English letters and inverted English letters including twenty-six capital English letters, eight small English letters of b, f, g, h, i, r, t, and y, four inverted capital letters of ㄥ, ㄛ, ㄚ, and ㄋinverted respectfully from F, G, Q and S, and four inverted small letters of ㄐ, ㄩ, ㄣand ㄟinverted respectively from h, n, r, and y;

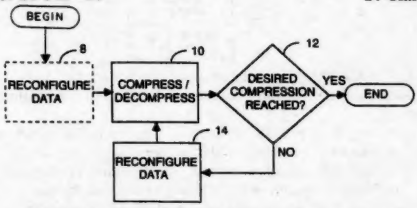
(C) denoting each of said posted letters in said combinations composing said Chinese characters with a corresponding English letter, thereby forming codes of said Chinese characters; and

(D) inputting said codes of said Chinese characters into the computer through the keyboard.

5,488,364
RECURSIVE DATA COMPRESSION

Michael L. Cole, San Diego, Calif., assignor to Sam H. Eulmi, San Diego, Calif.

Filed Feb. 28, 1994, Ser. No. 203,998
Int. Cl.[6] H02M 7/30
U.S. Cl. 341—50 14 Claims



1. A method for compressing data, comprising the steps of:

receiving a plurality of input data words, each consisting of a plurality of bits located in a plurality of positions;

compressing said plurality of input data words to form a plurality of compressed data words using a run-length based compression method;

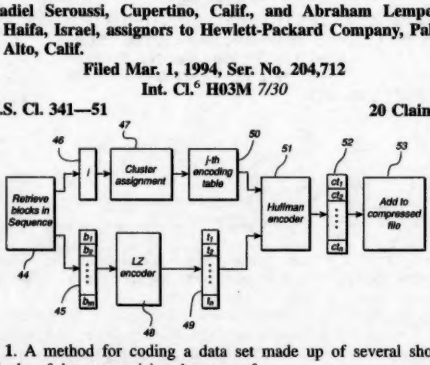
forming a plurality of reconfigured data words in response to said plurality of compressed data words, said plurality of reconfigured data words having an average frequency of occurrence of adjacent bits of the same binary state that is greater than the average frequency of occurrence of adjacent bits of the same binary state in said plurality of compressed data words; and

compressing said plurality of reconfigured data words using said run-length based compression method.

5,488,365
METHOD AND APPARATUS FOR COMPRESSING AND DECOMPRESSING SHORT BLOCKS OF DATA

Gadiel Seroussi, Cupertino, Calif., and Abraham Lempel, Haifa, Israel, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 1, 1994, Ser. No. 204,712
Int. Cl.[6] H03M 7/30
U.S. Cl. 341—51 20 Claims



1. A method for coding a data set made up of several short blocks of data, comprising the steps of:

inputting said data set;

partitioning said data set such that each data block is assigned to a specific cluster of data blocks;

generating a set of encoding tables for each cluster that specify a translation of said data blocks into binary codes, said table generating step further comprising the steps of:

grouping said data blocks according to a selected common characteristic to produce a number of data clusters: and

assigning said data blocks to said data clusters such that the sum:

$$S=S_T+S_E$$

is minimized, where S_T denotes the size of the encoding tables that are stored together with the encoded data blocks, S_E denotes the size of the encoded data blocks, and S denotes the total size of the compressed data set;

encoding said data blocks by applying the translation contained in said encoding tables to said data blocks;

generating an index table that references each data block to a corresponding encoding table;

translating said encoding table into a decoding table;

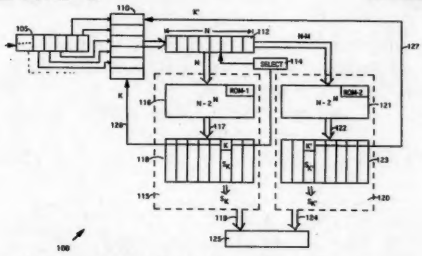
producing a compressed file including said index table, said decoding tables, and said encoded data blocks; and

storing said file on a storage medium.

5,488,366
SEGMENTED VARIABLE LENGTH DECODING APPARATUS FOR SEQUENTIALLY DECODING SINGLE CODE-WORD WITHIN A FIXED NUMBER OF DECODING CYCLES

Druong-Yow Wu, Hsingchu, Taiwan, Prov. of China, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan, Prov. of China

Filed Oct. 12, 1993, Ser. No. 134,067
Int. Cl.[6] H03M *7/40*
U.S. Cl. 341—67 **11 Claims**



1. A segmented variable length decoding apparatus for sequentially decoding a single codeword with a maximum codeword length of M within a fixed number of decoding operations, said decoding apparatus comprising:

a serial to parallel converting and shifting means for receiving N bits, where N being an integer and $N \leqq M$, from a serial bit stream and for receiving a shift-count S_C for shifting said bit stream by S_C bits for discarding the rightmost S_C bits and receiving S_C new bits from said bit stream, and converting said N bits from said serial bit stream to a parallel data record;

L segmented decoding means, where L being an integer, wherein each segmented decoding means including a segmented codeword dictionary table of bit length J_i, where J, and i being integers and i ranging from 1 to L and where $M=J_1+J_2+\ldots+J_L$,

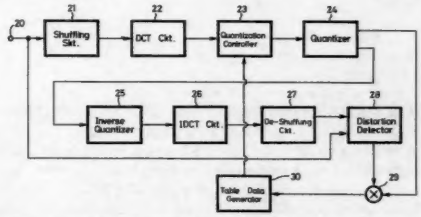
each of said segmented decoding means receiving and decoding said parallel data record of J_i bits by comparing said Ji bits with said segmented codeword dictionary table for generating an segmented output codeword of K_i bits and outputting said K_i bits to said parallel converting and shifting means as said shift-count; and

an output symbol means for receiving said shift count and processing said segmented output codewords from said L segmented decoding means for generating an output symbol thus decoding a single codeword within L decoding operations.

5,488,367
METHOD OF AND APPARATUS FOR GENERATING VARIABLE LENGTH CODE TABLE

Takuya Kitamura, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 13, 1994, Ser. No. 226,839
Claims priority, application Japan, Apr. 16, 1993, 5-090263
Int. Cl.[6] H04N *7/24*
U.S. Cl. 341—106 **8 Claims**



1. An apparatus for generating a variable length coding comprising:

compressing means for variable-length-code compressing input data and outputting statistic data representing an occurrence probability corresponding to a compressed code value obtained when input data is variable-length-coded;

expanding means for expanding data compressed by said compressing means;

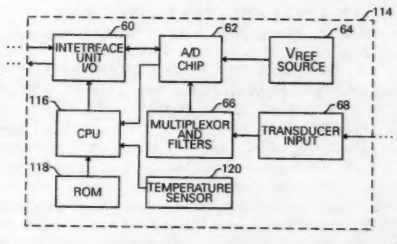
distortion amount detecting means for detecting a distortion amount of output data from said expanding means by comparing the output data from said expanding means and said input data; and

variable length code table generating means for generating a variable length code table on the basis of statistic data outputted from said compressing means and a distortion amount outputted from said distortion amount detecting means.

5,488,368
A/D CONVERTER SYSTEM AND METHOD WITH TEMPERATURE COMPENSATION

Eric W. Brown, Newport Beach, Calif., and Littlefield, James A., Boston, Mass., assignors to TechnoView Inc., Newport Beach, Calif.

Continuation-in-part of Ser. No. 69,029, May 28, 1993, Pat. No. 5,359,327. This application Jan. 13, 1994, Ser. No. 181,605
Int. Cl.[6] H03M *1/06*
U.S. Cl. 341—119 **14 Claims**



1. An A/D convertor circuit having low noise for converting an analog signal having a full scale input range into a digital signal, the circuit comprising:

an analog-to-digital conversion circuit that produces an uncompensated digital signal;

temperature compensation means for adjusting the uncompensated digital signal from the analog-to-digital conversion circuit to produce the digital signal; and

wherein the uncompensated digital signal is adjusted to compensate for variances due to the operating temperature of the A/D circuit; and

a voltage reference source having a diode with two terminals and a passive attenuation circuit coupled in parallel between the two terminals to provide a voltage reference signal, wherein the analog-to-digital circuit further includes a voltage reference input, wherein the voltage reference source is coupled to the voltage reference input of the analog-to-digital circuit, wherein the voltage reference signal is attenuated by the passive attenuation circuit to approximate the full scale input range of the analog signal.

5,488,369

HIGH SPEED SAMPLING APPARATUS AND METHOD FOR CALIBRATING THE SAME

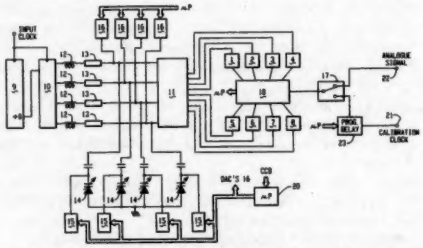
Allen Miller, Llandudno, United Kingdom, assignor to Gould Electronics, Ltd., London, United Kingdom

Filed Jul. 15, 1988, Ser. No. 220,215

Claims priority, application United Kingdom, Nov. 18, 1986, 8627533

Int. Cl.[6] H03M *1/10*

U.S. Cl. 341—122 **7 Claims**



1. A method of calibrating a high speed sampling apparatus comprising the steps of applying respective clock signals to each of a plurality of time multiplexed sampling devices, applying a timing reference signal to said multiplexed devices, comparing the results of the application of the clock and reference signals, adjusting the timing of at least one of the respective clock signals whereby to calibrate the devices, and wherein the step of adjusting the timing of at least one of the respective clock signals comprises the step of adjusting the mark/space ratio of said at least one respective clock signal.

5,488,370

ANALOG-TO-DIGITAL CONVERTER

Hirotaka Harada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

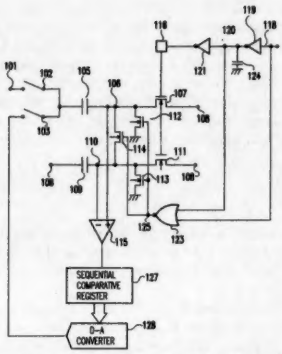
Filed Jul. 8, 1994, Ser. No. 272,679

Claims priority, application Japan, Aug. 23, 1993, 5-207457

Int. Cl.[6] H03M *1/42*

U.S. Cl. 341—161 **6 Claims**

1. An analog-to-digital converter which includes a differential amplifier having a first input terminal to which an analog signal to be converted into a digital signal is inputted by way of a first capacitive element and a second input terminal to which a reference voltage of a voltage source is inputted by way of a second capacitive element for differentially amplifying a voltage inputted thereto from said two input terminals and outputting an amplified voltage, a sequential comparing register for outputting a digital signal in response to an output signal of said differential amplifier,



a digital-to-analog converter for outputting an analog signal in response to the digital signal outputted from said sequential comparing register, and an inputting circuit for switching the signal to be supplied to said first input terminal of said differential amplifier between the output signal of said digital-to-analog converter and the analog input signal to be converted into a digital signal, comprising:

short-circuiting means for intermittently short-circuiting said first and second input terminals;

grounding means for grounding said first and second input terminals; and

driving means for driving said short-circuiting means and said grounding means.

5,488,371

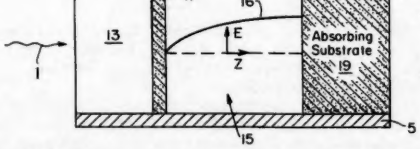
RADIO FREQUENCY ABSORBING WINDOWS

James D. Targove, Sudbury, Mass., assignor to Litton Systems, Inc., Lexington, Mass.

Filed Apr. 29, 1994, Ser. No. 236,500

Int. Cl.[6] H01Q *17/00*

U.S. Cl. 342—1 **52 Claims**



1. A radio frequency absorbing panel having a front side adapted to be exposed to an external environment including electromagnetic energy and a back side opposite the external environment, the panel comprising:

a series of parallel light transparent electrically conductive sheets, each conductive sheet spaced apart from an adjacent conductive sheet by a respective intermediate spacing distance, the spacing distance determined as a function of a predetermined radio frequency such that the conductive sheets absorbs substantially all electromagnetic energy at the predetermined radio frequency; and

a light transparent dielectric material disposed in the spacing between each conductive sheet to create an interference cavity between each conductive sheet.

5,488,372

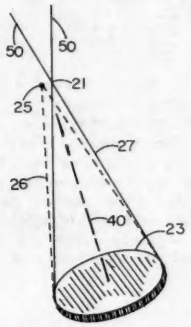
ELECTRONIC AVOIDANCE CONFIGURATIONS

Kenneth E. Fischer, 510 E. Main St., Box 327, Somerset, Pa. 15501

Continuation-in-part of Ser. No. 236,459, Jan. 28, 1981, abandoned, and a continuation-in-part of Ser. No. 972,527, Sep. 6, 1979, abandoned, which is a continuation-in-part of Ser. No. 675,602, Apr. 9, 1976, Pat. No. 4,066,226. This application Aug. 2, 1992, Ser. No. 404,308

Int. Cl.[6] H01Q *15/16;* B64C *1/00;* B64G *1/00*

U.S. Cl. 342—5 32 Claims



10. Aircraft having structural elements configured to avoid electronic tracking and sustained weapon system lock-on; said structural elements comprising, fuselage, lifting means, propulsion means, and empennage, elements:

(a) the structural elements having a plurality of faceted exterior reflecting surfaces;

(b) said facet surfaces being concave;

(c) a substantial number of said concave surfaces having a spherical surface figure with a radius of curvature greater than 20 miles;

(d) the concave surfaces being metallic, highly polished, and of high precision extending to razor sharp edges;

(e) the structural elements having substantially rectilinear polygonal cross sections formed by the concave surfaces;

(f) wherein at least one of the concave surfaces has a radius of curvature less than 1000 miles;

wherein said aircraft has functional components being positioned substantially within the structural elements.

5,488,373

SIGNAL PROCESSING APPARATUS FOR SYNTHETIC APERTURE RADAR

Hans Hellsten, Palmaers gata 6, S-582 49 Linköping, Sweden

PCT No. PCT/SE92/00184, § 371 Date Sep. 27, 1993, § 102(e) Date Sep. 27, 1993, PCT Pub. No. WO92/16856, PCT Pub. Date Oct. 1, 1992

PCT Filed Mar. 23, 1993, Ser. No. 122,482

Claims priority, application Sweden, Mar. 25, 1991, 9100898

Int. Cl.[6] G01S *13/90*

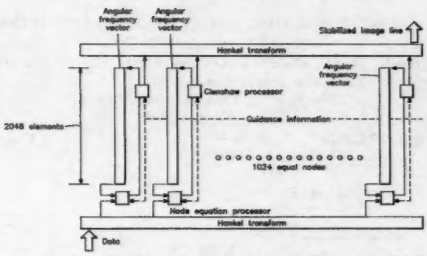
U.S. Cl. 342—25 20 Claims

1. A Signal processing apparatus for use in SAR radar having a radar transmitter, an antenna system for transmission and reception and a radar receiver, said signal processing apparatus being adapted for recursive computation of SAR images and comprising:

A) at least one memory, in which an SAR image with respect to a certain aircraft position of an aircraft along a flight path, is represented in the form of a coefficient matrix, an element of which are complex frequency components with respect to radial and angular frequency of the SAR image;

B) a first at least one computation unit, in which radar data as a function of range, are transformed to a data vector with respect to different radial frequencies;

C) a second at least one computation unit for computing, based on the coefficient matrix of said at least one memory, the data vector from the first at least one computation unit and information about a speed of the aircraft, and also based on a node equation, a second coefficient matrix with respect to a new aircraft position of said aircraft that is different from said certain aircraft position by a translation, free from rotation, of a distance that is smaller than a radar resolution and is a basis for a resolution in an image that represents radar data;



D) a third at least one computation unit for rotating said second coefficient matrix obtained as output from said second at least one computation unit based on a turning of the aircraft during the translation, if any, to produce a rotated coefficient matrix and for storing said rotated coefficient matrix in said at least one memory;

E) a fourth at least one computation unit, which, upon computation of said rotated coefficient matrix, by an inverse transformation from angular frequency to angular dependence, compresses all angular frequency terms for a given radial frequency to one number and thereby the rotated coefficient matrix to a line vector that defines the spectrum of the SAR image along an image line in a direction to a side of the aircraft;

F) an additional computation unit, which, by an inverse transformation from radial frequency to radial dependence, transforms the line vector to the SAR image along the image line.

5,488,374

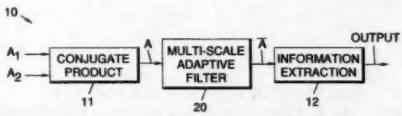
MULTI-SCALE ADAPTIVE FILTER FOR INTERFEROMETRIC SAR DATA

Robert T. Frankot, Van Nuys; Ralph E. Hudson, and George H. Senge, both of Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 14, 1994, Ser. No. 323,414

Int. Cl.[6] G01S *13/90*

U.S. Cl. 342—25 5 Claims



1. Apparatus for use with a synthetic aperture radar for processing interferometric synthetic aperture radar data comprising complex images, said apparatus comprising:

a conjugate product processor which is adapted to receive complex images and produce a complex interferogram;

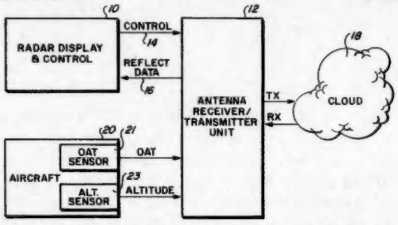
a multi-scale adaptive filter coupled to the conjugate product processor for processing the complex interferogram to produce a filtered interferogram; and

an information extraction processor coupled to the multi-scale adaptive filter that produces a predetermined data product.

5,488,375
AIRBORNE WEATHER RADAR SYSTEM WITH ICING DETECTION CAPABILIY

Terry K. Michie, Olathe, Kans., assignor to AlliedSignal Inc., Morris Township, Morris County, N.J.

Filed Sep. 28, 1994, Ser. No. 314,555
Int. Cl.[6] G01S *13/95*
U.S. Cl. 342—26 **8 Claims**



1. An airborne weather radar system with icing detection capability, comprising:

display and control means;

antenna/receiver/transmitter (ART) means;

means connected to the display and control means and to the ART means for applying control data from said display and control means to said ART means;

temperature sensor means and altitude sensor means mounted on an aircraft carrying the airborne weather radar system and connected to the ART means fop applying outside temperature and aircraft altitude signals to said ART means;

said ART means transmitting pulses into space and receiving reflection pulses when said transmitted pulses are intercepted by super-cooled liquid water (SLW) and rainfall weather formations, Said ART means including a central processing unit (CPU), receiver means fop receiving the reflection pulses, the CPU connected to the receiver means for applying frequency control and sensitivity control signals thereto, whereby the receiver means provides signals tuned to a predetermined frequency, and at a predetermined sensitivity level, depending on which mode of a rainfall mode and an icing mode the radar system is in, and means connected to the receiver means and to the CPU and responsive to the signals from the receiver means, and to a mode signal and a temperature enable signal from the CPU for detecting and separating the signals from the receiver means into rainfall levels and icing levels, with the icing level being detected only if the temperature is below a predetermined level, and for averaging the levels of the detected signals, and for temporarily storing the average signals; and

means connected to the display and control means and to the ART means for applying SLW and rainfall data from said ART means to said display and control means which displays the SLW data and the rainfall data so that the rainfall conditions and SLW conditions are distinguished from each other, whereby a pilot of the aircraft is provided with information for avoiding icing caused by SLW conditions.

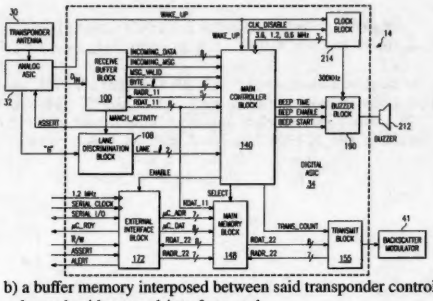
5,488,376
TRANSPONDER INTERFACE CIRCUIT

Dwaine S. Hurta, Garland, Tex., and Guenther Froschermeier, Abensberg, Germany, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 26, 1994, Ser. No. 233,871
Int. Cl.[6] G01S *13/76*
U.S. Cl. 342—42 **19 Claims**

1. A transponder interface circuit interposed between a transponder controller and an external interface, said external interface being in electrical communication with circuitry that is external to said transponder, said transponder interface circuit comprising:

a) an interface controller operable to communicate with said transponder controller;



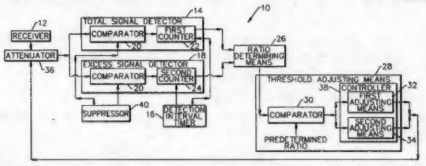
b) a buffer memory interposed between said transponder controller and said external interface; and

a clock selection multiplexer for passing a data clocking signal to said buffer memory from one of at least two sources, the first source being said the signal derived from the transponder: clock, and the second source being the clock signal originating in said external circuitry, the appropriate source being chosen by a signal to the multiplexer from said interface controller and chosen to correspond with whichever of the transponder and the external circuitry is accessing buffer memory.

5,488,377
METHOD AND APPARATUS FOR CONTROLLING THE FALSE ALARM RATE OF A RECEIVER

Albert H. Reynolds, III, St. Louis; Rand E. Boettger, Florissant, both of Mo., and Steven W. Pauly, St. Petersburg, Fla., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Mar. 28, 1995, Ser. No. 412,418
Int. Cl.[6] G01S *7/34;15/00*
U.S. Cl. 342—93 **20 Claims**



1. An apparatus for controlling the false alarm rate of a receiver wherein the receiver is adapted to receive signals in response to source signals which are transmitted at a predetermined transmission frequency, thereby defining a predetermined transmission period between source signals, the apparatus comprising:

total signal detecting means for detecting each received signal which has a power level greater than a predetermined threshold level and which is received within a predetermined detection interval, wherein the predetermined detection interval includes at least one predetermined transmission period, and wherein the signals received within a predetermined transmission period can include an initial signal which has a power level greater than the predetermined threshold level and a plurality of excess signals received subsequent to the initial signal which also have a power level greater than the predetermined threshold level;

excess signal detecting means for detecting each excess signal which is received within the predetermined detection interval;

ratio determining means, responsive to said total signal detecting means and said excess signal detecting means, for determining a ratio of the total number of received signals detected by said total signal detecting means within the predetermined detection interval to the total number of excess signals detected by said excess signal detecting means within the predetermined detection interval; and

threshold adjusting means, responsive to said ratio determining means, for adjusting the threshold level in response to the

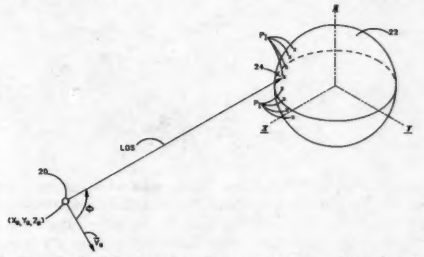
ratio determined by said ratio determining means such that the false alarm rate of the receiver is thereby controlled.

5,488,378

METHOD AND APPARATUS FOR DETERMINING POSITIONS ON THE EARTH CORRESPONDING TO AN OBSERVED RATE OF CHANGE OF SATELLITE RANGE

Jaime B. Colley, Laguna Niguel, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Dec. 28, 1993, Ser. No. 174,085
Int. Cl.[6] G01S *5/02*; H04B *7/185*
U.S. Cl. 342—357 **17 Claims**



1. A method of determining, for a particular position, location coordinates for the particular position, the method comprising the steps of:

receiving, at a receiver located at the particular position, signals from at least one earth-orbiting satellite, the signals including orbital information indicating the general location of the at least one satellite with respect to an earth-centered, earth-fixed (ECEF) coordinate system;

measuring the rate of change of the range from the satellite to the receiver; and

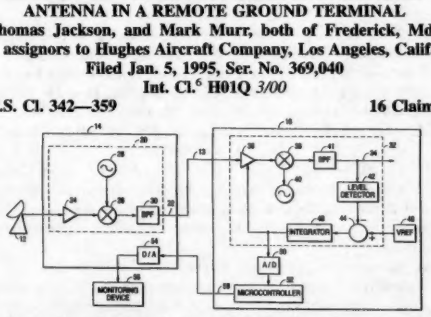
calculating, based upon the satellite orbital information and measured rate of change of the range from the satellite to the receiver, a first plurality of points representing a first line on the earth's surface along which the rate of change of range of the satellite is constant, such that the location of the receiver at the particular position is near the first line.

5,488,379

APPARATUS AND METHOD FOR POSITIONING AN ANTENNA IN A REMOTE GROUND TERMINAL

Thomas Jackson, and Mark Murr, both of Frederick, Md., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 5, 1995, Ser. No. 369,040
Int. Cl.[6] H01Q *3/00*
U.S. Cl. 342—359 **16 Claims**



1. An apparatus for orienting a directional antenna of a remote ground terminal which receives a signal from a satellite, said apparatus comprising:

a down-converter for demodulating said signal to an intermediate frequency signal, said down-converter comprising an automatic gain control loop for maintaining said intermediate frequency signal at a predetermined power level;

a controller coupled to said down-converter so as to monitor a voltage level of said automatic gain control loop, said controller operative to generate a difference signal corresponding to the difference of said voltage level when said signal from said satellite is being received by said down-converter from when said signal from said satellite is not received by said down-converter,

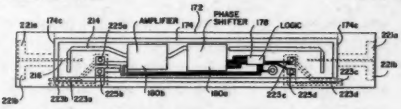
wherein said difference signal varies proportionally with the amplitude of said signal from said satellite received by said down-converter, said difference signal used for orienting said directional antenna.

5,488,380

PACKAGING ARCHITECTURE FOR PHASED ARRAYS

Donn T. Harvey, Issaquah, and George W. Fitzsimmons, Kent, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 705,816, May 24, 1991, Pat. No. 5,276,455. This application Sep. 20, 1993, Ser. No. 123,086
Int. Cl.[6] H01Q *3/22;13/00;21/00*; H01P *1/00*
U.S. Cl. 342—368 **19 Claims**



1. An apparatus for coupling electro-magnetic (EM) energy between a waveguide through which said EM energy propagates and an electronics unit, comprising:

a printed dipole antenna;

a coupled coplanar strip transmission line connected to said printed dipole antenna;

a slotline connected to said coupled coplanar strip transmission line, said EM energy being transferred between said waveguide and said slotline via said printed dipole antenna; and

a microstrip transmission line integral to said electronics unit and physically isolated from said slotline, said EM energy being coupled between said slotline and said microstrip transmission line,

wherein said printed dipole antenna and said electronic unit are disposed within said waveguide.

5,488,381

METHOD FOR THE MANAGEMENT OF THE BEAM OF AN ELECTRONICALLY SCANNED ROTATING ANTENNA

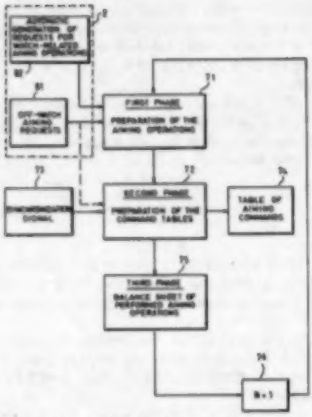
Marie-Claude Bardy, Massy, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 28, 1994, Ser. No. 313,907
Claims priority, application France, Sep. 28, 1993, 93 11503
Int. Cl.[6] H01Q *3/22*; G01S *13/00*
U.S. Cl. 342—372 **10 Claims**

1. A method for the management of the beam of an electronically scanned rotating antenna on the basis of requests for the aiming of the beam, said method organizing the sequencing or succession of the aiming commands given to a system for the formation of the beam by means of a table of commands comprising the parameters needed to carry out the aiming operations, the antenna having a visibility cone in which the electronic scanning enables the aiming operations to be performed, the position of the antenna being identified according to an angular step, the passage from one step another generating a synchronization signal, for each antenna rotation, the sequencing of the commands is organized in three phases, each associated with one zone of the space:

a first phase of preparation of the requested aiming operations before their entry into the visibility cone, said phase consisting in defining the parameters of the table of the commands associated with each requested aiming operation;

a second phase of carrying out the requested aiming operations present in the visibility cone, a new table of commands being



sent from each synchronization signal as a function of the aiming operations that have not yet been carried out;

a third phase of identifying the requested aiming operations that have come out from the visibility cone and have not been carried out, these aiming operations being memorized and carried out in a following rotation, it being possible for a non-performed aiming operation to be relinquished.

5,488,382

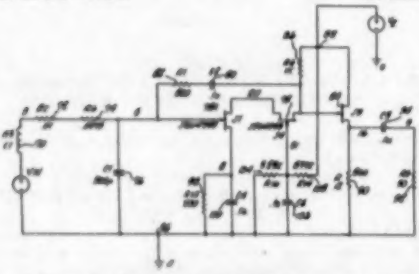
LOW NOISE AMPLIFIER

Neal O. Fenzi, and Stephen I. Long, both of Santa Barbara, Calif., assignors to Superconductor Technolgies Inc., Santa Barbara, Calif.

Continuation of Ser. No. 37,598, Mar. 26, 1993, abandoned. This application May 10, 1995, Ser. No. 438,522

Int. Cl.[6] H01Q *1/26*

U.S. Cl. 343—700 R **14 Claims**



1. A detection circuit for detecting electromagnetic radiation comprising:

a low loss antenna having a characteristic impedance and an output,

a semiconductor Field Effect Transistor (FET) amplifier having an input and an output, said output of said low loss antenna being connected directly to said input of said semiconductor amplifier, and

an impedance connected to said semiconductor amplifier between said input of said semiconductor FET amplifier and said output of said semiconductor FET amplifier, said impedance and said semiconductor FET amplifier having an optimum noise impedance substantially equal to said characteristic impedance of said low loss antenna.

5,488,383

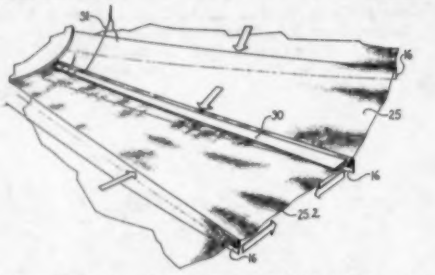
METHOD FOR ACCURIZING MESH FABRIC REFLECTOR PANELS OF A DEPLOYABLE REFLECTOR

Arnold Friedman, Redwood City; William Ribble, San Jose, and William D. Wade, Los Gatos, all of Calif., assignors to Lockheed Missiles & Space Co., Inc., Sunnyvale, Calif.

Filed Jan. 21, 1994, Ser. No. 181,747

Int. Cl.[6] H01Q *15/14*

U.S. Cl. 343—912 **6 Claims**



1. In a deployable reflector of the kind which includes a hub assembly, a plurality of radially extendable ribs members spaced about a periphery of said hub assembly for supporting a plurality of gore-shaped metalized mesh fabric reflector panels stretched thereacross and attached thereto so that a dish-shaped reflective surface is formed when said reflector is deployed, a method for accurizing the mesh fabric reflector panels comprising:

a) placing at least one wedge-shaped tool on a first slack gore-shaped mesh fabric reflector panel adjacent a seam which joins a long side edge of said first gore-shaped mesh fabric reflector panel to an adjacent long side edge of a second gore-shaped mesh fabric reflector panel;

b) lacing a chord through the strands of said first gore-shaped mesh fabric reflector panel and back and forth over said wedge-shaped tool along its length;

c) withdrawing said wedge-shaped tool from said first gore-shaped mesh fabric reflector panel; and

d) pulling taut opposite ends of said chord to remove the slack from the reflector panels.

5,488,384

DISPLAY CONTROL SYSTEM FOR DETERMINING CONNECTION OF OPTIONAL DISPLAY UNIT BY USING PALETTE

Keiichi Uehara, and Tooru Hanada, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 221,455, Apr. 1, 1994, abandoned, which is a continuation of Ser. No. 904,021, Jun. 25, 1992, abandoned. This application Dec. 28, 1994, Ser. No. 365,175

Claims priority, application Japan, Jun. 26, 1991, 3-154677

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—1 **6 Claims**

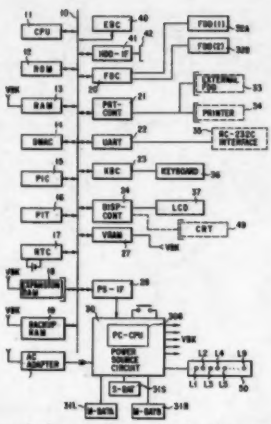
1. A display control system in a computer system having a flat panel display unit as a standard display unit, and allowing a CRT display unit as an optional display unit to be connected thereto, comprising:

a video memory for storing display data;

a graphic subsystem for writing and reading display data in and from said video memory, and for displaying display data on one of the flat panel display unit and the CRT display unit connected to said display control system;

means, having a plurality of color registers, for converting digital R, G, and B signal output from said graphic subsystem into R, G, and B display analog signal levels, and outputting the display analog signal levels as a video signal to the CRT display unit;

means for writing first test data in said plurality of color registers;



means for producing a reference level and comparing the R, G and B display analog signal levels which are output from said plurality of color registers as a video signal, with the produced reference level;

first determining means for determining whether a color CRT is connected in accordance with the result of the comparing means; and

means for initializing the color CRT, when the first determining means determines that the color CRT is connected.

5,488,385

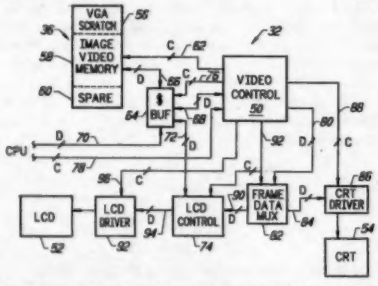
MULTIPLE CONCURRENT DISPLAY SYSTEM

Dave M. Singhal, San Jose, and Sidong Li, Sunnyvale, both of Calif., assignors to Trident MicroSystems, Inc., Mountain View, Calif.

Filed Mar. 3, 1994, Ser. No. 206,010

Int. Cl.[6] G09G *5/12*

U.S. Cl. 345—3 **10 Claims**



1. A display system providing for the simultaneous accelerated generation of independent video information for presentation on multiple independent displays, said display system comprising:

a) a video memory having a plurality of addressable storage locations, each storage location providing for the storage of data representing a component of an independent displayable image, said video memory providing for accelerated accessing of said addressable storage locations within pages of said addressable storage locations;

b) a data buffer having a first data interface coupled to said video memory and a second interface data interface coupleable to an external host computer system to provide a direct data transfer path to said video memory; and

c) a video controller, coupled to said video memory, to provide a plurality of sets of output display control and data signals coupleable to a respective plurality of video displays, said video controller including means for accessing said video memory in a predetermined addressing pattern to access a sequence of said components corresponding to a plurality of said independent displayable images where said components of a first independent displayable image are interleaved with said components of a second independent displayable image in predetermined ones of said pages of said addressable storage locations, said video controller further including control means, responsive to said accessed sequence of said components, for generating said plurality of sets of output display control and data signals where each said set of said plurality of said output display control and data signals corresponds to a respective one of said independent displayable images.

5,488,386

IMAGING APPARATUS AND OPERATION METHOD OF THE SAME

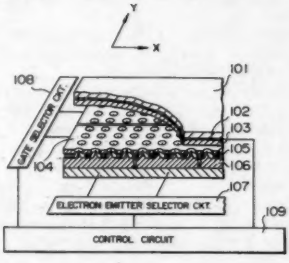
Toshio Yamagishi, Kawasaki; Masakazu Nanba; Norifumi Egami, both of Tokyo; Kenkichi Tanioka, Tama; Mitsuhiro Kurashige, Yono; Kazutaka Tsuji, Hachioji; Yoshiyuki Kaneko, Hachioji; Tatsuo Makishima, Tokyo; Kazuyuki Nagatsuma, Hachioji; Tetsuya Ohshima, Kokubunji, and Yasushi Nakano, Tokyo, all of, Japan, assignors to Hitachi, Ltd., and Nippon Hoso Kyokai, both of Tokyo, Japan

Filed Dec. 2, 1993, Ser. No. 160,655

Claims priority, application Japan, Dec. 2, 1992, 4-322911

Int. Cl.[6] G09G *3/22*

U.S. Cl. 345—74 **17 Claims**



1. An imaging apparatus comprising:

a photoconductive target including a transparent electrode layer for transmitting incident light from outside and a photoconductive layer for generating and storing a signal charge in response to the incident light;

a plurality of electron beam emitters disposed adjacent said photoconductive layer of said photoconductive target, each electron beam emitter capable of assuming alternatively an activated state, in which the electron beam emitter emits electrons, and an inactivated state;

control means for temporarily changing over the state of said electron beam emitters to change the emitters which are emitting electrons from among said electron beam emitters;

means for reading a signal charge stored in a portion of said photoconductive layer; and

gate electrodes for accelerating the emitted electrons from the activated electron beam emitters to transfer the electrons to said photoconductive target.

5,488,387

METHOD FOR DRIVING DISPLAY DEVICE

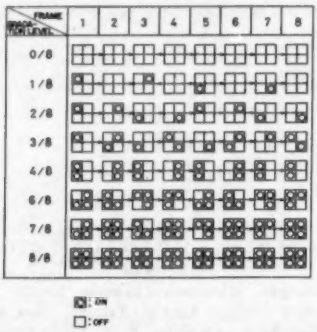
Hiroshi Maeda, Yamatokooriyama, and Takuro Omori, Nara, both of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 884,229, May 11, 1992, abandoned, which is a continuation of Ser. No. 489,206, Mar. 6, 1990, abandoned. This application Feb. 28, 1994, Ser. No. 203,617

Claims priority, application Japan, Mar. 7, 1989, 1-54377; Apr. 28, 1989, 1-109973

Int. Cl.[6] G09G 1/14

U.S. Cl. 345—89 12 Claims



1. A method for driving a display device to create a gradationally toned display of at least one of a plurality of brightness levels by setting a plurality of sequential frame time periods, during which each of a plurality of pixels on a screen of the display device is controlled to display an image, as one integration time period and by turning on pixels for a number of specified frame time periods corresponding to display data of the image within the integration time period, the method comprising the steps of:

grouping the plurality of pixels of the display device into a plurality of groups, each composed of a plurality of contiguous pixels;

selecting a number of pixels to be turned on for one integration time period corresponding to specified gradation data, for each of the plurality of groups; and

setting a number of pixels to be turned on for each of the sequential frame time periods within each integration time period, such that a minimum and a maximum number of pixels turned on within each integration time period is established by at least the second sequential frame time period, for each of the plurality of brightness levels, to thereby reduce display flicker, wherein the difference between the minimum and maximum number of pixels turned on within each integration time period, at each brightness level, is, at most, one pixel.

5,488,388

LIQUID CRYSTAL APPARATUS

Osamu Taniguchi, Chigasaki; Hiroshi Inoue, Yokohama; Atsushi Mizutome, Fujisawa; Tadashi Mihara, Atsugi; Yoshihiro Onitsuka, Yokohama, and Masahiro Terada, Atsugi, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

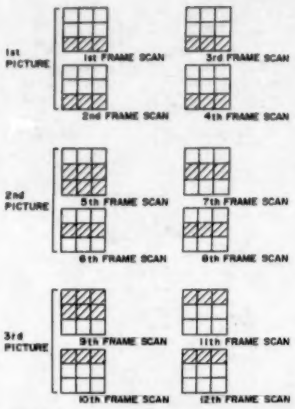
Continuation of Ser. No. 898,941, Jun. 15, 1992, which is a division of Ser. No. 164,504, Mar. 4, 1988, Pat. No. 5,182,549. This application Jul. 14, 1994, Ser. No. 274,155

Claims priority, application Japan, Mar. 5, 1987, 62-051775; Mar. 31, 1987, 62-078003; Jun. 8, 1987, 62-143874; Jul. 27, 1987, 62-188298

Int. Cl.[6] G09G 3/36

U.S. Cl. 345—97 5 Claims

1. A liquid crystal display apparatus, comprising scanning lines and data lines intersecting each other, with ferroelectric liquid



crystal material having a memory property disposed therebetween, to form an electrode matrix and a pixel at each intersection, and adapted to display a motion picture by consecutively displaying a plurality of different pictures on the electrode matrix, each said pixel showing different display states corresponding to different polarities of voltages applied thereto, said display apparatus comprising:

scanning means for applying scanning selection signals to the scanning lines, said scanning means comprising:

first scanning means for sequentially applying a first scanning selection signal, comprising a voltage of one polarity, to the scanning lines to effect odd-numbered frame scanning operations; and

second scanning means for sequentially applying a second scanning selection signal, comprising a voltage of another polarity opposite to the one polarity, to effect even-numbered frame scanning operations, wherein the one polarity and the other polarity are defined with respect to a voltage level applied to a non-selected scanning line which does not receive any of the first and second scanning selection signals; and

data signal output means for supplying data signals to the data lines in synchronism with each of the first and second scanning selection signals, said data signal output means supplying identical data signals to the data lines for at least three consecutive frame scanning operations and for displaying an identical picture for at least two consecutive frame scanning operations of the at least three consecutive frame scanning operations.

5,488,389

DISPLAY DEVICE

Kaoru Nakanishi, Izumisano; Shinji Horino, Nara; Kiyoshi Shiono, Osaka; Hiroshi Tanaka, Higashiosaka, and Kunihiro Terada, Tenri, all of, Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Sep. 21, 1992, Ser. No. 948,297

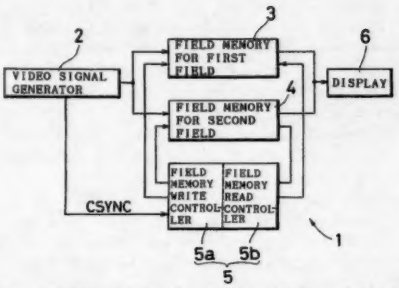
Claims priority, application Japan, Sep. 25, 1991, 3-245904; Sep. 27, 1991, 3-249737; Feb. 19, 1992, 4-032080; May 26, 1992, 4-133930

Int. Cl.[6] G09G 5/00

U.S. Cl. 345—131 6 Claims

1. A display device for display video signals where interlaced video signals are converted into non-interlaced video signals by dividing the interlaced video signals into a first field composed of odd-numbered horizontal scanning lines and a second field composed of even-numbered horizontal scanning lines, comprising:

a display having fewer horizontal display lines than a predetermined number of horizontal scanning lines for composing one screen of video information,



a memory for storing interlaced video signals, each interlaced video signal corresponding to a portion of one display line, and

a memory controller for writing the video signals into the memory in synchronism with a horizontal synchronizing signal provided with the interlaced video signals, dividing the horizontal scanning lines into consecutive groups, selecting one scanning line to be thinned from every group, and consecutively reading out from the memory the same video signal twice in synchronism with a read-out signal having a frequency twice that of the horizontal synchronizing signal but reading the video signal corresponding to the selected scanning line to be thinned from every group only once in accordance with the horizontal synchronizing signal, and applying the read out video signals to the display.

5,488,390

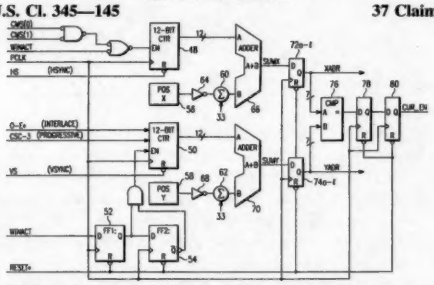
APPARATUS, SYSTEMS AND METHODS FOR DISPLAYING A CURSOR ON A DISPLAY SCREEN

Christopher L. Reinert, and Sudhir Sharma, both of Plano, Tex., assignors to Cirrus Logic, Inc., Fremont, Calif.

Filed Jul. 29, 1993, Ser. No. 98,844

Int. Cl.[6] G09G *3/02*

U.S. Cl. 345—145 **37 Claims**



1. Circuitry for controlling the display position of a cursor on a display operable to display information as at least one field of a plurality of lines of pixels, comprising:

first counter circuitry operable to increment with each of a plurality of selected pixels of a said line;

first storage circuitry operable to store position data representing a first coordinate of a reference pixel in said field, said reference pixel associated with an area of said field in which said cursor is to be displayed;

first adding circuitry operable to add a count corresponding to a current pixel output from said first counter to said position data in said first storage circuitry;

second counter circuitry operable to increment with each line of said field;

second storage circuitry operable to store position data representing a second coordinate of said reference pixel;

second adding circuitry operable to add a count corresponding to said current pixel output from said second counter to said position data in said second storage circuitry; and

comparator circuitry operable to compare an output of said first adding circuitry and an output of said second adding circuitry to a predetermined value and in response output an enable signal when said current pixel is within said area of said field in which said cursor is to be displayed.

5,488,391

METHOD AND DEVICE FOR THE OPTIMIZING OF THE PERFORMANCE CHARACTERISTICS OF A LIQUID CRYSTAL DISPLAY MATRIX SCREEN AS A FUNCTION OF THE ANGLE OF OBSERVATION

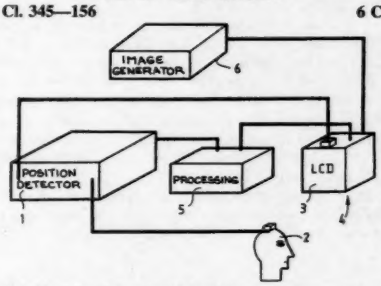
Jean-Jacques Favot, Martignas/Jalles; Jean-Pierre Fontan, Cadaujac, and Jean-Noël Perbet, Eysines, all of, France, assignors to Sextant Avionique, Meudon La Foret, France

Filed Oct. 19, 1992, Ser. No. 962,702

Claims priority, application France, Jan. 22, 1991, 91 13011

Int. Cl.[6] G09G *5/00;3/36*

U.S. Cl. 345—156 **6 Claims**



1. A method for the optimizing of the performance characteristics of a liquid crystal display matrix screen as a function of an angle of observation of an image on the screen by an observer, comprising the steps of:

representing the observation space before the screen as a hemisphere and dividing the observation space into elementary zones corresponding to different angular positions, relative to the screen, in which the observer may be placed in order to look at the image,

associating a particular processing operation of the image to be shown on the screen with each zone;

determining, for each zone, a set of micro-zones that are each formed by several pixels of the screen;

determining, for elementary zones, a luminance level of each pixel and a chrominance level of each micro-zone of the screen

memorizing the determined values; then,

detecting a position of the observer with respect to the screen; and

modifying at least one of the parameters of the processing of the image to be presented on the screen as a function of the values that are memorized and that correspond to the detected angle of observation.

5,488,392

PRECISION, ABSOLUTE MAPPING COMPUTER POINTING DEVICE AND VERSATILE ACCESSORIES

Thomas S. Harris, 10863 W. Fuller Pl., Baton Rouge, La. 70816

Filed Apr. 28, 1994, Ser. No. 234,841

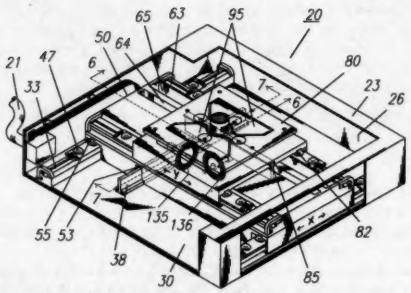
Int. Cl.[6] G09G *3/02*

U.S. Cl. 345—157 **19 Claims**

1. A manually operable signal generating device that generates signals suitable for controlling objects on a display device, said signal generating device comprising:

a base having a first axis, and having a second axis substantially perpendicular to said first axis;

a carriage mounted to said base;



a pointer mounted to said carriage;

a first ball bearing mounting means for guiding uniaxial movement of the carriage along the direction of the first axis and for inhibiting said carriage of movement that is perpendicular to said first axis;

a second ball bearing mounting means for guiding uniaxial movement of the pointer along the direction of the second axis and for inhibiting said pointer of movement relative to the carriage that is perpendicular to said second axis;

movement detection means for generating signals indicative of the direction and the magnitude of movement of the carriage along the first axis and for generating signals indicative of the direction and the magnitude of movement of the pointer along the second axis; and

electrical circuitry coupling said movement detection means to a microprocessor that generates signals and sends said signals to said display device translated as commands.

5,488,393

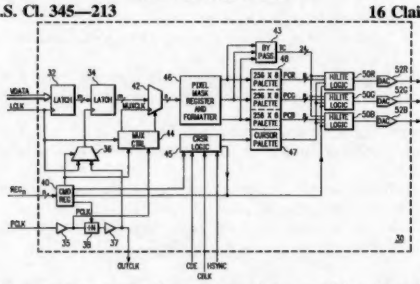
HIGH-SPEED VIDEO DISPLAY SYSTEM

Paul B. Wood, Spring, and Brian F. Bounds, Cypress, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 695,963, May 6, 1991, Pat. No. 5,291,187. This application Jun. 23, 1993, Ser. No. 81,794

Int. Cl.[6] G09G *5/06*

U.S. Cl. 345—213 **16 Claims**



1. A computer system for processing data comprising video data, said computer system comprising:

a processor;

a video controller;

a first bus coupled between said processor and said video controller;

a memory for storing video data;

a second bus coupled between said video controller and said memory, wherein said video controller is operable to provide said video data to said memory; and

a video display driver circuit for driving a display device, comprising:

a first clock terminal for receiving a pixel clock signal;

a second clock terminal for receiving a latch clock signal;

an output clock terminal;

a frequency divider circuit, for receiving the pixel clock signal from said first clock terminal, and for presenting, at said output clock terminal, an output clock signal having a period which is a multiple of the period of said pixel clock signal;

a plurality of data terminals for receiving said pixel data from said memory;

a latch, coupled to said data terminals and to said second clock terminal, for storing pixel data received at said data terminals responsive to said latch clock signal;

a multiplexer, having a data input coupled to said latch for receiving said pixel data, having a clock input coupled to receive said pixel clock signal, and having an output, said multiplexer for applying a selected portion of said pixel data to its output responsive to said pixel clock signal; and

output circuitry coupled to the output of said multiplexer, for presenting said pixel data to said display device.

5,488,394

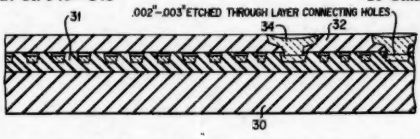
PRINT HEAD AND METHOD OF MAKING SAME

Donald C. Sedberry, Gwynedd, Pa., assignor to Max Levy Autograph, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 195,030, Feb. 14, 1994, Pat. No. 5,416,502, which is a division of Ser. No. 928,352, Aug. 12, 1992, Pat. No. 5,317,342, which is a division of Ser. No. 408,529, Sep. 18, 1989, Pat. No. 5,162,191, which is a division of Ser. No. 141,113, Jan. 5, 1988, Pat. No. 4,897,676. This application Aug. 8, 1994, Ser. No. 286,967

Int. Cl.[6] B41J *2/395*

U.S. Cl. 346—141 **10 Claims**



4. A print head made by the method comprising the steps of:

a) providing a smooth substrate material, at least the surface of the substrate comprising a dielectric material,

b) applying a layer of material capable of selectively resisting etchants, to the surface of the dielectric,

c) coating the etchant-resistive layer of material with a photoresist,

d) exposing the photoresist to light, the light being directed through a phototool comprising a pattern representing a desired pattern of conductors forming the print head,

e) developing the photoresist to expose the etchant-resistive layer of material in those locations corresponding to elements of the desired pattern of conductors,

f) removing the exposed portions of said etchant-resistive layer of material,

g) etching into the dielectric material, in those locations where the etchant-resistive layer of material has been removed, to form grooves in the dielectric material,

h) removing residual photoresist and etchant-resistive material,

i) filling the grooves with a cermet material capable of bonding to the dielectric substrate upon the application of heat, and

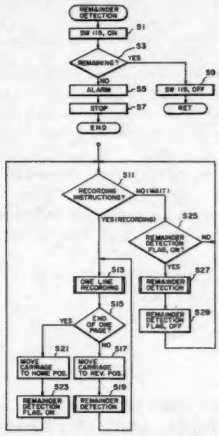
j) firing the substrate to a temperature sufficient to bond the cermet material to the grooves in the dielectric material,

wherein the print head is free of organic materials.

5,488,395
LIQUID JET RECORDING APPARATUS

Yoshiaki Takayanagi; Asao Saito, and Ryoichi Koizumi, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 707,945, May 28, 1991, abandoned, which is a continuation of Ser. No. 452,499, Dec. 19, 1989, abandoned. This application Sep. 12, 1994, Ser. No. 304,205
Claims priority, application Japan, Dec. 20, 1988, 63-321505
Int. Cl.[6] B41J *2/195*
U.S. Cl. 347—7 **48 Claims**



1. An ink jet recording apparatus, comprising:

a recording head having ejection outlets for ejecting ink;

ink supply means for supplying the ink to said recording head;

an element for receiving electrical power when detecting a remaining amount of the ink in said ink supply means;

control means for supplying electrical power to said element to detect the ink remaining in said ink supply means, wherein said control means permits supply of electrical power to said element when a remainder detection instruction is set, and prevents supply of electrical power to said element when said remainder detection instruction is not set;

setting means for setting the remainder detection instruction to permit an ink remainder detecting operation in a stand-by state; and

resetting means for resetting the remainder detection instruction ill response to execution of the ink remainder detecting operation in the stand-by state so that the remainder detection instruction is not set.

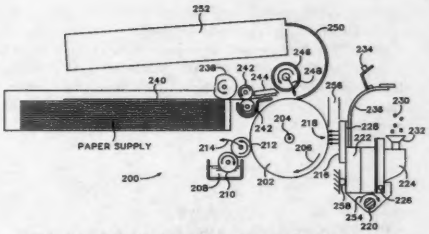
5,488,396
PRINTER PRINT HEAD POSITIONING APPARATUS AND METHOD

Edward F. Burke, Lake Oswego, and Randy C. Karambelas, Milwaukie, both of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Filed Mar. 7, 1994, Ser. No. 206,998
Int. Cl.[6] B41J *11/20*
U.S. Cl. 347—37 **21 Claims**

1. An improved print head positioner in a printer of a type in which a print medium scans in a first direction and a print head has an array of marking means uniformly spaced apart in a second direction for printing correspondingly spaced apart indicia on the print medium, and in which the print head is moved a predetermined distance in the second direction by a print head positioner for each of a predetermined number of print medium scans to print the print medium, the improved print head positioner comprising:

an input motion means for imparting a first amount of motion to the print head positioner for each scan of the print medium;



an adjustable scale factor means for providing a scale factor to move the print head in adjustably changeable lateral movements the predetermined distance, the scale factor means being coupled by a first coupling means to the input motion means; and

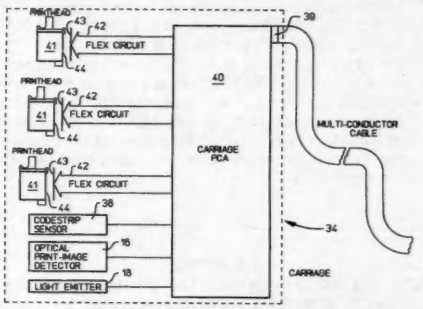
an output motion means coupled by a second coupling means to the adjustable scale factor means for imparting the predetermined distance to the print head;

whereby the scale factor is adjustable to accurately convert the first amount of motion into the predetermined distance such that the indicia are uniformly spaced apart in the second direction on the print medium after the predetermined number of print medium scans.

5,488,397
WIDE-SWATH PRINTER/PLOTTER USING MULTIPLE PRINTHEADS

Michael A. Nguyen, Singapore, Singapore; Lowell J. Stewart, Poway, Calif.; Daniel S. Kline, Carlsbad, Calif.; Robert A. Boeller, Poway, Calif.; Chuong C. Ta, and Robert D. Haselby, both of San Diego, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 786,146, Oct. 31, 1991, Pat. No. 5,241,325. This application Nov. 4, 1991, Ser. No. 787,297
Int. Cl.[6] B41J *2/01;2/07*
U.S. Cl. 347—40 **15 Claims**



1. A printer/plotter having multiple printheads which move in a given scan direction to apply a swath of images to media which is periodically advanced in a media feed direction, comprising:

carriage means for holding multiple printheads which are separately mountable on said carriage means;

first mounting means on said carriage means for holding a first printhead a predetermined distance from the media;

second mounting means on said carriage means for holding a second printhead a predetermined distance from the media, said second mounting means holding said second printhead in a position displaced from said first printhead in the media feed direction such that a width of a swath printed by both said first and second printheads in a single traverse of said carriage means is greater than a swath printed by only one of said first and second printheads;.

multiple printing elements on each of said first and second printheads;

adjustment means operatively connected to said second printhead for changing the relative position of active printing elements on said second printhead with respect to active printing elements on said first printhead, said adjustment means including selection means for turning off certain of said active printing elements on said second printhead which overlap active printing elements on said first printhead.

5,488,398

INK JET RECORDING APPARATUS CAPABLE OF EMPHASIZING THE DENSITY OF BLACK

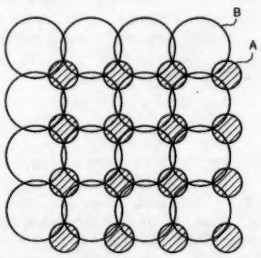
Miyuki Matsubara, Tokyo; Hiromitsu Hirabayashi, Yokohama; Hitoshi Sugimoto, Kawasaki, and Kiichiro Takahashi, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1992, Ser. No. 923,390

Claims priority, application Japan, Aug. 1, 1991, 3-193189

Int. Cl.[6] B41J *2/01*

U.S. Cl. 347—43 **31 Claims**



1. An ink jet recording apparatus for discharging a plurality of different colored inks, to thereby record color images on a recording medium, comprising:

a plurality of recording heads having a number of discharge ports through which the inks are discharged therefrom, and a number of discharge means for discharging corresponding to said number of discharge ports, said recording heads including a recording head for discharging black ink ;and

discharge amount control means for controlling an amount of ink discharged from each of said recording heads;

wherein, for a recording portion to be printed in black, the black ink and at least one color ink other than black are discharged and said discharge amount control means makes an amount of the black ink discharged greater than the amount of the ink other than black.

5,488,399

BELT DRIVING APPARATUS AND IMAGE RECORDING APPARATUS USING THE SAME

Tatsuo Mitomi; Tomohiro Aoki, both of Yokohama; Yasushi Murayama, Tokyo; Takashi Uchida, Yokohama; Tohru Kobayashi, Tokyo; Masatoshi Ikkatai, Kawasaki, and Masaharu Nemura, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

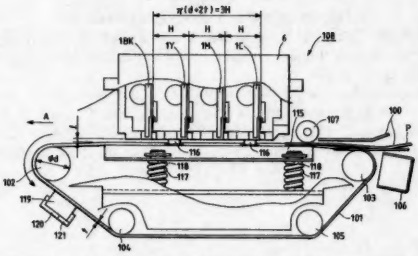
Continuation of Ser. No. 347,175, Nov. 22, 1994, abandoned, which is a continuation of Ser. No. 225,002, Apr. 7, 1994, abandoned, which is a continuation of Ser. No. 774,355, Oct. 10, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 497,999

Claims priority, application Japan, Jan. 12, 1990, 2-273818

Int. Cl.[6] B41J *2/21;2/385;* **G03G** *15/01*

U.S. Cl. 347—43 **27 Claims**

24. A recording medium conveying apparatus for use in an image recording apparatus for recording an image on a conveying recording medium by a plurality of image recording mechanisms disposed at an image recording area, said apparatus comprising:



an endless recording medium conveying member for conveying the recording medium, said conveying member having a surface for mounting the recording medium and a thickness t;

a first image recording position disposed at an image recording area;

a second image recording position disposed at the image recording area; and

a drive roller member for driving said endless recording medium conveying member, said drive roller member having a diameter D,

wherein a distance between the first and second image recording positions is equal to π(D+2 t).

5,488,400

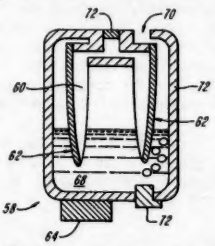
METHOD FOR REFILLING INK JET CARTRIDGES

Richard G. Crystal, Los Altos, Calif.; Raymond Geffre, Fort Fairfield, Me., and Sven Karlsson, San Jose, Calif., assignors to Graphic Utilities, Inc., Concord, Mass.

Continuation of Ser. No. 86,620, Jul. 1, 1993, abandoned, which is a continuation of Ser. No. 975,477, Nov. 12, 1992, abandoned. This application Jul. 7, 1994, Ser. No. 271,185

Int. Cl.[6] B41J *2/175*

U.S. Cl. 347—85 **17 Claims**



1. The method of re-filling with ink an at least partially depleted ink jet cartridge, said cartridge having a top end and a bottom end including:

(a) a housing enclosing an internal ink reservoir extending between said top end and said bottom end,

(b) a bubble generator affixed to the housing,

(c) an ink fill aperture extending through said housing near said top end and coupling said reservoir to a region exterior to said cartridge,

(d) a means for sealing said ink fill aperture,

(e) a negative pressure assembly including:

i. a bladder disposed within said reservoir,

ii. an air port affixed to the top of said housing including means for coupling a region interior to said bladder to said region exterior to said cartridge,

iii. spring means for biasing said bladder toward a minimum volume state, comprising the steps of:

A. positioning said cartridge with said top end above said bottom end,

B. unsealing said ink fill aperture,

C. sealing said air port and then inflating said bladder to establish an internal volume thereof in a predetermined range,

D. injecting ink into said reservoir through said ink fill aperture,

E. sealing said ink fill aperture, and

F. unsealing said air port.

5,488,401

INK-JET RECORDING APPARATUS AND INK TANK CARTRIDGE THEREOF

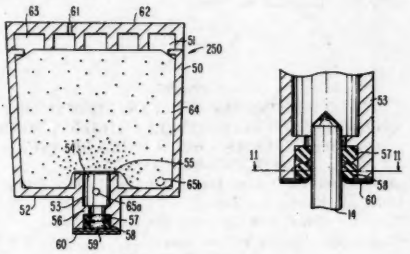
Seiji Mochizuki; Kazuhisa Kawakami; Masahiro Nakamura; Keiichi Ohshima, and Masanori Yoshida, all of Suwa, Japan, assignors to Seiko Epson Corporation, Japan

Continuation-in-part of Ser. No. 742,529, Aug. 7, 1991, Pat. No. 5,255,019, which is a continuation of Ser. No. 642,761, Jan. 18, 1991, Pat. No. 5,070,346. This application Aug. 11, 1992, Ser. No. 928,936

Claims priority, application Japan, Jan. 28, 1992, 4-012834; Feb. 19, 1992, 4-03226; Mar. 16, 1992, 4-058151

Int. Cl.[6] B41J *2/175*

U.S. Cl. 347—86 **106 Claims**



32. An ink tank cartridge for an ink-jet type recording apparatus being removably mountable onto an ink supply needle of a recording apparatus body, said ink supply needle having at least one throughhole to allow ink to pass therethrough, the ink tank cartridge comprising:

a housing formed with a chamber therein;

an ink supply port extending through and projecting from a wall of said housing, said ink supply port having a first opening directed towards said chamber of said housing and a second opening directed away from said wall of said housing;

at least one porous member accommodated in said chamber of said housing for having ink impregnated therein, said porous member resiliently abutting against said first opening of said ink supply port;

a packing member provided within said ink supply port towards said second opening, said packing member being formed with a hole therethrough dimensioned to receive said ink supply needle and to resiliently abut against an outer periphery of said ink supply needle of said ink-jet type recording apparatus, said packing member preventing the flow of ink through said ink supply port other than through said ink supply needle when said needle is positioned in said ink supply port;

a sealing member separate from said packing member positioned to seal said second opening of said ink supply port before said ink tank cartridge is mounted on said ink supply needle and to be penetrated by said ink supply needle when said ink tank cartridge is mounted on said ink supply needle; and

a stopping member provided between said packing member and said sealing member positioned and dimentioned to prevent pieces of said sealing member produced when said ink supply needle penetrates said sealing member from entering said ink supply port past said sealing member.

5,488,402

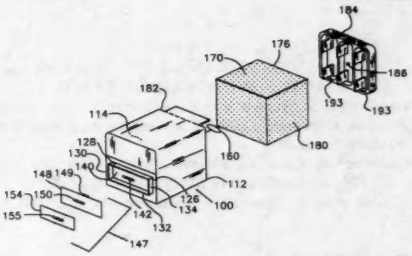
METHOD AND APPARATUS FOR PREVENTING COLOR BLEED IN A MULTI-INK PRINTING SYSTEM

James P. Shields, and Garold E. Radke, both of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 926,259, Aug. 5, 1992, Pat. No. 5,428,383. This application Mar. 10, 1995, Ser. No. 401,534

Int. Cl.[6] C09D *11/02*

U.S. Cl. 347—96 **8 Claims**



1. An inkjet ink set for use in printing multi-colored images while controlling color bleed between adjacent printed regions comprising:

a first ink composition, said first ink composition comprising a first coloring agent; and

a second ink composition, said second ink composition comprising a second coloring agent and a precipitating agent which will react with said first coloring agent in said first ink composition in order to form a precipitate therefrom.

5,488,403

PRINTING ELEMENT DRIVE DEVICE HAVING SEPARATELY OPERATING SHIFT REGISTERS

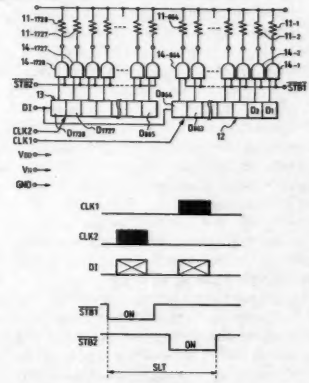
Takaya Nagahata, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Jul. 1, 1993, Ser. No. 86,501

Claims priority, application Japan, Jul. 31, 1992, 4-204841

Int. Cl.[6] B41J *2/355*

U.S. Cl. 347—211 **5 Claims**



1. A printing element drive circuit comprising:

n printing elements;

first and second shift registers each having at least n/2 memory cells, the first and second shift registers receiving common bit-serial printing data and receiving first and second clock pulse signals respectively, wherein in a first period the first shift register stores a first part of the printing data of n/2 bits during application of the first clock signal and in a second

period the second shift register stores a second part of the printing data of n/2 bits during application of the second clock signal; and

at least n drive elements for driving the n printing elements in accordance with the printing data stored in the first and second shift registers, the printing elements being in one-to-one correspondence with the memory cells of the first and second shift registers.

5,488,404

OPTICAL CHARACTER GENERATOR FOR AN ELECTRO PHOTOGRAPHIC PRINTER

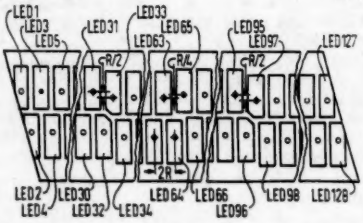
Friedrich Fleck, Munich, and Klaus-Dieter Jörgens, Baldham, both of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 576,394, Sep. 26, 1990, abandoned. This application May 23, 1994, Ser. No. 247,507

Claims priority, application Germany, Mar. 11, 1988, 38 08 219.5

Int. Cl.[6] B41J *2/45*

U.S. Cl. 347—238 **17 Claims**



1. An optical character generator of an electro photographic printer for generating a charge image on a revolving charge storage drum, the charge image being composed of micro-image lines each generated continuously during one printing cycle, the optical character generator receiving printing information that is transmitted over a bus system by a printer control, the bus system operatively connecting the printer control to the optical character generator, comprising:

a plurality of character generator modules arranged in a row, each of the modules having a plurality i of light-emitting diode means for emitting light, each of the light-emitting diode means having a plurality of light-emitting diodes arranged in k rows extending in a longitudinal direction where k is a finite whole number greater than one, light-emitting diodes of a respective row of said k rows having a predetermined offset in said longitudinal direction with respect to light-emitting diodes of other rows of said k rows;

the light-emitting diodes of each light-emitting diode means being subdivided along the longitudinal direction into n multi-row light-emitting diode groups where n is a finite whole number greater than one, the diode groups being distributed without overlap in a direction parallel to said longitudinal direction and being geometrically offset with respect to one another in a direction lateral to said longitudinal direction of the rows of light-emitting diodes;

each of the character generator modules further having a plurality of kxi control means for controlling the light-emitting diodes, each of the control means of the plurality of kxi control means having inputs connected to the bus system for selectively receiving printing information serially supplied by the printer control and having parallel outputs respectively connected to light-emitting diodes of a respective row of the k rows of the light-emitting diode means;

each of the control means of the plurality of kxi control means having a processing unit for converting the received printing information into n groups of drive control signals for selectively activating the light-emitting diodes and a switching unit, each said processing unit having n part-circuits associated respectively with the n multi-row light-emitting diode groups, each part-circuit of the n part-circuits of each processing unit of each of the control means of the plurality of kxi control means respectively generating from said printing information a respective one of the n groups of drive control signals such that the n groups of drive control signals, for compensating for said offset of each of the multi-row light-emitting diode groups, are temporally staggered with respect to each other;

each said processing unit further having driver means connected to respective part-circuits of the n part-circuits for receiving the n groups of drive control signals from the respective part-circuits of the n part-circuits associated therewith and for outputting individual drive signals to the light-emitting diodes connected to the respective control means of the plurality of kxi control means;

the switching unit of each of the control means of the plurality of kxi control means being connected to the respective n part-circuits and generating timing control signals that are temporally staggered and input to the respective n part-circuits to effect said temporal staggering of the drive control signals;

wherein staggering of the drive control signals occurs in a predetermined timing pattern of the printing cycle and is dependent on the respective offset of an associated light-emitting diode group, so that a straight micro-image line, which is linearly assembled section by section, is generated on the charge storage drum.

5,488,405

VIDEO PRINTER HAVING A FRAME MEMORY CONFIGURED TO EFFECTIVELY UTILIZE A DOUBLE-DENSITY PRINTING HEAD WHEN PRINTING REDUCED-SIZE IMAGES

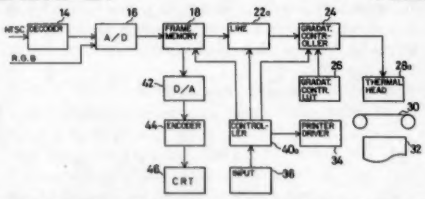
Yoshiki Kawaoka, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 29, 1993, Ser. No. 83,254

Claims priority, application Japan, Jun. 29, 1992, 4-170384

Int. Cl.[6] H04N *1/21*

U.S. Cl. 347—254 **2 Claims**



1. A video printer for printing a plurality of reduced images on one recording paper, the reduced images being arranged on the one recording paper in columns, the reduced images corresponding, respectively, to a plurality of received images, each of the received images having, in a vertical direction, a number of effective scan lines, and having, in a horizontal direction, a number of pixels, said video printer comprising:

a frame memory which stores columns and rows of pixels, said frame memory having a capacity to store in a column a number of pixels that is approximately equal to the number of effective scan lines, and having a capacity to store in a row a number of pixels that is approximately twice the number of pixels of each of the received images in the horizontal direction;

a printing head comprising a number of printing elements that is approximately twice the number of pixels stored in a column of said frame memory, said printing elements being disposed to print vertical lines of pixels; and

controller means which reduces image data of said received images and which writes into the frame memory the reduced image data of the reduced images which form one of said columns of images, such that the reduced image data which is used to print one of said vertical lines of pixels is stored in

two columns of the frame memory, said controller supplying the reduced image data stored in the frame memory to said printing head in order to prim one of the columns of images.

5,488,406

METHOD AND APPARATUS FOR THE EXPOSING OF LIGHT-SENSITIVE MATERIAL TO BE EXPOSED

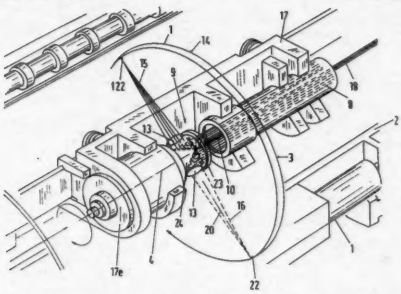
Horst Rubi, Kassel-Baunatal, Germany, assignor to Scangraphic PrePress Technology GmbH, Wedel, Germany

Filed May 21, 1993, Ser. No. 65,606

Claims priority, application Germany, May 21, 1992, 42 17 238.1

Int. Cl.[6] B41J *2/47*

U.S. Cl. 347—259 **23 Claims**



1. A method for exposing a photo-sensitive material to be exposed comprising

placing the photosensitive material to be exposed into a casing defining an inner circular arc-shaped cylinder and sealed against entry of light from external light sources, wherein the material to be exposed is disposed in the circular arc-shaped cylinder and is thereby disposed at a uniform spacing from a center longitudinal axis of the arc-shaped cylinder;

generating a laser beam with a laser generator;

modulating the laser beam in a laser modulator;

deflecting the modulated laser beam into a collimator;

directing the collimated laser beam, aligned parallel to the center longitudinal axis, onto a rotatable mirror having two mirror faces, wherein each one of the two mirror faces is disposed at an angle relative to the center longitudinal axis; focusing a laser beam reflected on one of the mirror faces with an optical system;

directing the focused laser beam radially onto a focusing surface, where focal points of the reflected and focused laser beam are rotary circulating on the surface of the material to be exposed;

exposing the material to be exposed with signals, providing point-shaped exposure spots on the material to be exposed, with the laser beam coming from the rotatable mirror and from the optical system.

5,488,407

IMAGE RECORDING APPARATUS

Shunichi Tachibana, Urayasu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

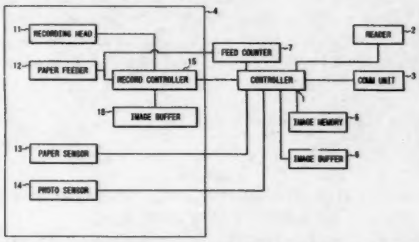
Continuation of Ser. No. 320,553, Oct. 11, 1994, which is a continuation of Ser. No. 212,649, Mar. 14, 1994, abandoned, which is a continuation of Ser. No. 97,227, Jul. 27, 1993, abandoned. This application Apr. 10, 1995, Ser. No. 419,529

Claims priority, application Japan, Jul. 28, 1992, 4-201159; Jul. 9, 1993, 5-170027

Int. Cl.[6] H04N *1/21*

U.S. Cl. 347—264 **31 Claims**

1. An image recording apparatus comprising:



print data generation means for generating print data, including first control means for controlling a process relating to the generation of the print data;

recording means for recording an image on a recording medium in accordance with the print data generated by said print data generation means;

feed means for feeding the recording medium to a recording position of said recording means;

second control means for controlling operations of said recording means and said feed means;

detection means for detecting the recording medium upstream of the recording position along the feed direction of the recording medium; and

count means for counting a feed amount of the recording medium by said feed means;

said first control means determining whether remaining print data can be printed or not at the detection of a trailing edge of the recording medium by said detection means based on the count of said count means and outputting a control signal to renew a page to said second control means when a decision not to permit the recording is made.

5,488,408

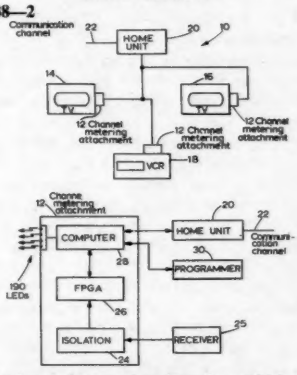
SERIAL DATA CHANNEL METERING ATTACHMENT FOR METERING CHANNELS TO WHICH A RECEIVER IS TUNED

Kenneth S. Maduzia, Holiday; Kenneth J. Frett, Crystal Beach, and James J. Vitt, Dunedin, all of Fla., assignors to A.C. Nielsen Company, Northbrook, Ill.

Filed Mar. 22, 1994, Ser. No. 215,899

Int. Cl.[6] H04N *7/10*

U.S. Cl. 348—2 **36 Claims**



1. An attachment for metering channels to which a receiver is tuned, the receiver having a serial data communication bus for carrying serial data between components of the receiver, the attachment comprising:

channel determining means for determining a channel to which the receiver is tuned, the channel determining means determining the channel in response to the serial data;

connecting means for connecting the channel determining means to the serial data communication bus of the receiver; and,

means connected to the channel determining means for carrying an output identifying the channel to which the receiver is tuned.

5,488,409

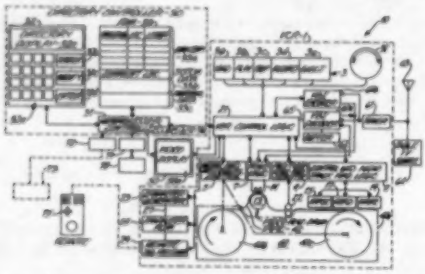
APPARATUS AND METHOD FOR TRACKING THE PLAYING OF VCR PROGRAMS

Henry C. Yuen, P.O. Box 1159, Redondo Beach, Calif. 90278, and Daniel S. Kwoh, 3975 Hampstead Rd., La Canada, Flintridge, Calif. 91011

Continuation-in-part of Ser. No. 66,666, May 27, 1993, which is a continuation-in-part of Ser. No. 14,541, Feb. 8, 1993, which is a continuation-in-part of Ser. No. 1,125, Jan. 5, 1993, which is a continuation-in-part of Ser. No. 883,607, May 7, 1992, abandoned, which is a continuation-in-part of Ser. No. 817,723, Jan. 7, 1992, abandoned, which is a continuation-in-part of Ser. No. 805,844, Dec. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 747,127, Aug. 19, 1991, abandoned. This application Sep. 16, 1993, Ser. No. 122,794

Int. Cl.[6] H04N *5/782;5/91*

U.S. Cl. 348—5 **14 Claims**



1. A video tape player for monitoring user selection habits of a plurality of video tapes, each video tape containing a plurality of programs, a first type of video tapes having a title information symbol on a predetermined interval of the tape for each program on the tape, the video tape player comprising:

a clock for providing a time;

means for moving the video tape;

a magnetic head for detecting the plurality of programs recorded on the video tape and the title information symbols on the first type of video tape and a plurality of programs recorded on a second type of video tape;

a detector for receiving user inputted commands for controlling the movement of the video tape, the user inputted commands comprising a start play command to start moving, in a longitudinal direction, the video tape proximate to the magnetic head so that the magnetic head can detect said programs on the video tape and a stop play command to stop moving the tape;

a controller coupled to said detector for commanding the moving means in response to said detected user inputted commands and reading the time of occurrence of said detected user inputted commands;

a first memory for storing a title information symbol for each program on the second type of video tape;

a second memory for storing the title information symbol and the time of occurrence of said detected user inputted commands; and

means for providing the contents of the second memory to an external analyzer in response to a download command.

5,488,410

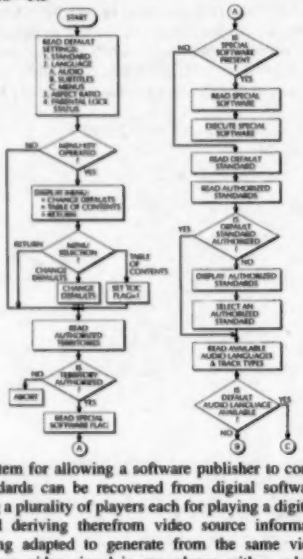
SYSTEM AND METHOD FOR DISK SOFTWARE PUBLISHERS TO CONTROL DISK DISTRIBUTION

Warren N. Lieberfarb; Christopher J. Cookson, and Lewis S. Ostrover, all of Los Angeles, Calif., assignors to Telectronics Pacing Systems, Inc., Englewood, Colo.

Filed Oct. 29, 1993, Ser. No. 145,979

Int. Cl.[6] H04N *7/01;7/16;7/167*

U.S. Cl. 348—5.5 **8 Claims**



1. A system for allowing a software publisher to control which video standards can be recovered from digital software carriers comprising a plurality of players each for playing a digital software carrier and deriving therefrom video source information, each player being adapted to generate from the same video source information a video signal in accordance with a selected video standard; and a plurality of digital software carriers each having (i) a lead-in section including a code indicative of the video standards which have been authorized for that carrier by the software publisher and (ii) in a section following said lead-in section, separate video source information; each of said players including means for reading the lead-in section of any software carrier being played, independent of said code; and means for enabling generation of a video signal in accordance with the selected video standard only if it is included among the video standards which have been authorized by said code in the lead-in section of the digital software carrier being played, and for inhibiting the generation of a video signal in a video standard which has not been authorized in the lead-in section of the digital software carrier.

5,488,411

INTERACTIVE SYSTEM FOR A CLOSED CABLE NETWORK

Scott W. Lewis, Saratoga, Calif., assignor to Multimedia Systems Corporation, San Jose, Calif.

Filed Mar. 14, 1994, Ser. No. 212,353

Int. Cl.[6] H04N *7/173*

U.S. Cl. 348—8 **12 Claims**

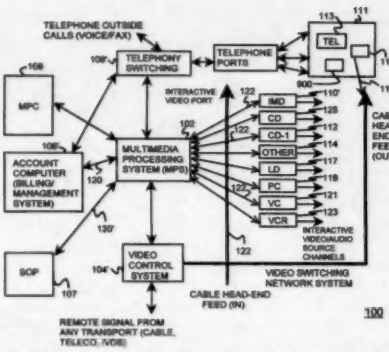
1. An interactive system for a closed cable network comprising:

means for processing multimedia information;

means coupled to the multimedia processing means for receiving telephone messages from and transmitting telephone messages to the multimedia processing means;

means coupled to the mutimedia processing means for receiving account information from and transmitting account information to the multimedia processing means;

means coupled to the multimedia processing means for receiving control information from and transmitting control information to the multimedia processing means;



a plurality of multimedia devices coupled to the multimedia processing means to provide updatable multimedia information and;

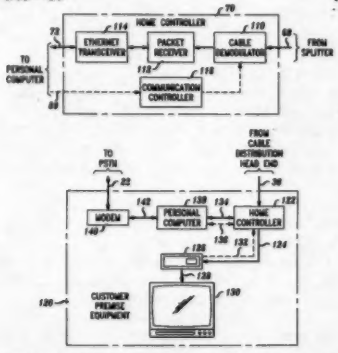
multiplexer means coupled to an Interactive Multimedia Decoder (IMD), the multiplexer means for receiving inputs from the plurality of multimedia devices and for selecting from the plurality of multimedia devices to provide a multimedia output signal to the IMD.

5,488,412

CUSTOMER PREMISES EQUIPMENT RECEIVES HIGH-SPEED DOWNSTREAM DATA OVER A CABLE TELEVISION SYSTEM AND TRANSMITS LOWER SPEED UPSTREAM SIGNALING ON A SEPARATE CHANNEL

Venkata C. Majeti; Mowaffak T. Midani, both of Naperville, Ill.; Richard J. Watson, Catawissa, Mo., and Kenneth A. Zabriskie, Indianapolis, Ind., assignors to AT&T Corp., Murray Hill, N.J.

Filed Mar. 31, 1994, Ser. No. 221,336
Int. Cl.[6] H04N *7/173*
U.S. Cl. 348—10 **6 Claims**



3. A customer premises equipment which supports communications between a user and information providers, said equipment connected to a television system cable that supports high speed communication channels carrying information sent from the information providers and a lower speed transmission channel that carries user generated requests transmitted to the information providers, the lower speed transmission channel being a transmission medium physically separate from the transmission medium that transports the high speed cable transmission channel, the customer premises equipment comprising:

a tunable demodulator that demodulates radio frequency (RF) signals carried by said high speed cable channel, said demodulator translating encoded packets of data carded as said RF signals into digitally formatted packets;

receiver means coupled to said demodulator for identifying ones of said digitally formatted packets having a predetermined address associated with a user;

a modem coupled to said lower speed transmission channel for transmitting requests and receiving control signals that identify one of said high speed channels which carry said ones of said digitally formatted packets;

a personal computer means, coupled to said modem and operating under the control of a program, for effecting communications between the user and the information providers;

means coupled to said receiver means for transmitting data derived from said ones of digitally formatted packets to said personal computer;

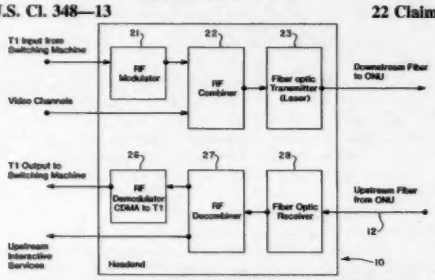
said personal computer coupled to said demodulator and transmitting channel selection signals based on said control signals to said demodulator to control the RF channel to which said tunable demodulator is tuned, thus enabling reception of said ones of encoded packets over an RF channel determined by the control signals.

5,488,413

CATV TELEPHONY SYSTEM USING SUBSPLIT BAND FOR BOTH DIRECTIONS OF TRANSMISSION

Joseph M. Elder, Boulder; Donald L. Bise, Parker; Terry D. Bolinger, Aurora, and Peter Ruether, Longmont, all of Colo., assignors to XEL Communications, Inc., Aurora, Colo.

Filed Jun. 14, 1994, Ser. No. 259,479
Int. Cl.[6] H04N *7/173*
U.S. Cl. 348—13 **22 Claims**



1. In a cable television (CATV) system for distribution of a video signal and for two-way telephone communications, having a headend, a plurality of optical network units (ONU's) connected to said headend by fiber optics, a plurality of coaxial cables extending from each ONU to a plurality of subscriber units, and a number of line amplifiers located at intervals along said coaxial cables between said ONU's and said subscriber units, the improvement comprising:

said headend having a downstream path for distribution of video and telephone signals to said ONU's and an upstream path for receiving telephone signals from said ONU's, said headend downstream path including:

(a) means for modulating said downstream telephone signal to a first frequency band below said video signal;

(b) means for combining said modulated downstream telephone signal with said video signal; and

(c) means for transmitting said combined telephone and video signals over said fiber optics to said ONU's;

said ONU's having a downstream path for distribution of said combined telephone and video signals from said headend to said subscriber units and an upstream path for relaying telephone signals from said subscriber units to said headend;

said subscriber units having:

(a) means for receiving said downstream telephone signal transmitted by said ONU's;

(b) means for modulating said upstream telephone signal to a second frequency band below said video signal; and

(c) means for transmitting said modulated upstream telephone signal over said coaxial cable to said ONU's; and

said line amplifiers having means for maintaining a signal path through said line amplifiers for said telephone signals in the event of failure of said line amplifiers.

5,488,414

VIDEO CAMERA APPARATUS HAVING MODE SELECTION DISPLAY ON ELECTRONIC VIEWFINDER SCREEN

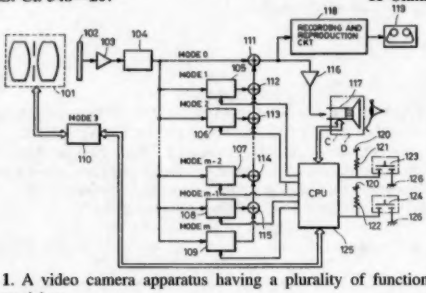
Masahide Hirasawa, Sagamihara, and Kohji Takahashi, Yokohama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 844,777, Mar. 2, 1992, abandoned. This application May 20, 1994, Ser. No. 247,117

Claims priority, application Japan, Mar. 12, 1991, 3-046564

Int. Cl.[6] H04N *5/225*

U.S. Cl. 348—207 **11 Claims**



1. A video camera apparatus having a plurality of functions, comprising:

(a) function selecting means for performing a selection operation to choose at least two functions to be executed from the plurality of functions;

(b) common function executing means for executing the at least two functions selected through said function selecting means;

(c) an image monitor for displaying a representation of the at least two functions selected as well as a picture being taken by said video camera apparatus; and

(d) control means for controlling the display of said image monitor to indicate the at least two functions selected through said function selecting means on said image monitor prior to the execution of the at least two functions through said function executing means.

5,488,415

SOLID-STATE IMAGE PICKUP DEVICE HAVING A PHOTOELECTRIC CONVERSION DETECTION CELL WITH HIGH SENSITIVITY

Masayuki Uno, Ina, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 15, 1994, Ser. No. 260,345

Claims priority, application Japan, Jul. 9, 1993, 5-193009; Dec. 28, 1993, 5-349012

Int. Cl.[6] H04N *3/14*

U.S. Cl. 348—241 **11 Claims**

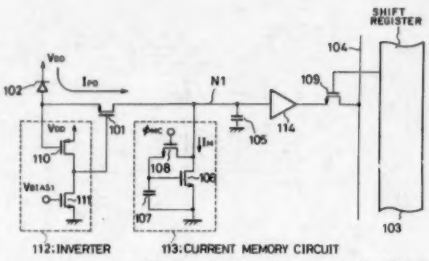
1. A solid-state image pickup device comprising a detection cell, said detection cell comprising:

a photodiode;

a storage capacitor for storing a photo-induced charge induced in said photodiode;

a transfer transistor, the source of said transfer transistor being connected to said photodiode, the drain of said transfer transistor being connected to said storage capacitor;

an inverter, the input of said inverter being connected to said photodiode, the output of said inverter being connected to the gate of said transfer transistor; and



a current memory circuit, said current memory circuit being connected in parallel to said storage capacitor, said current memory circuit being capable of maintaining a current at a value corresponding to a current flowing out via said transfer transistor.

5,488,416

IMAGE SENSING METHOD AND APPARATUS IN WHICH THE EXPOSURE TIME MAY BE VARIED

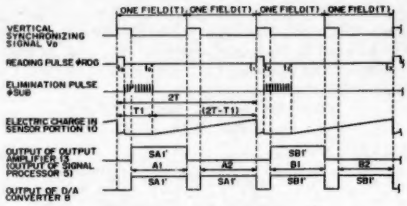
Kenji Kyuma, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 313,399, Sep. 27, 1994, abandoned, which is a continuation of Ser. No. 2,277, Jan. 8, 1993, abandoned, which is a continuation of Ser. No. 783,214, Oct. 28, 1991, Pat. No. 5,194,957. This application Mar. 13, 1995, Ser. No. 403,120

Claims priority, application Japan, Nov. 2, 1990, 2-295202

Int. Cl.[6] H04N *3/14*

U.S. Cl. 348—296 **20 Claims**


ONE FIELD(T)
VERTICAL SYNCHRONIZING SIGNAL Vo
READING PULSE ΦROG
ELIMINATION PULSE ΦSUB
ELECTRIC CHARGE IN SENSOR PORTION 10
OUTPUT OF OUTPUT AMPLIFIER 15 (OUTPUT OF SIGNAL PROCESSOR 51)
OUTPUT OF D/A CONVERTER 9

1. A camera comprising:

sensing means for receiving a light signal, performing a photoelectric conversion, and storing information;

reading means for reading the information from said sensing means once each reading period nT (where n is an integer equal to or greater than 2 and T is a field period of a standard television signal);

eliminating means for eliminating information from said sensing means, the eliminated information corresponding to a partial interval T1 within the reading period nT;

altering means for altering the width of the partial interval T1;

memory means for storing information outputted from said sensing means at a reading period nT; and

memory control means for controlling said memory means in such a manner that the information stored in said memory means, is outputted at a field period T.

5,488,417

AUTOMATIC KINESCOPE BIAS CONTROL SYSTEM

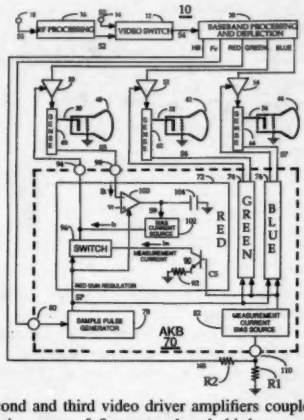
Dal F. Griepentrog, Indianapolis, Ind., assignor to Thomson Consumer Electronics, In., Indianapolis, Ind.

Filed May 19, 1994, Ser. No. 246,067

Int. Cl.[6] H04N *5/68*

U.S. Cl. 348—379 **1 Claim**

1. Color television display apparatus, comprising:



first, second and third video driver amplifiers coupled to apply respective ones of first second and third component video signals to respective ones of first second and third kinescope cathodes;

first, second and third current sensors coupled to respective ones of said cathodes for providing respective first second and third cathode current indicating signals;

an AKB system including first, second and third AKB regulators, each having an input for receiving a respective cathode current indicating signal and an output coupled to supply a respective black level control current to a respective one of said kinescope drivers, each said black level control current including a black level bias component, Ia, and a black level measurement current component, Im; and

means responsive to an analog voltage provided by a heater of one of said cathodes for controlling the magnitudes of said black level measurement currents during horizontal trace intervals and for suppressing said black level measurement currents during horizontal retrace intervals.

5,488,418

ENCODER AND DECODER

Hidetoshi Mishima, and Takashi Itow, both of Kyoto, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

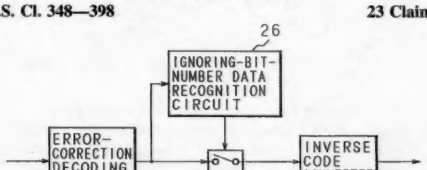
PCT No. PCT/JP92/00432, § 371 Date Dec. 3, 1992, § 102(e) Date Dec. 3, 1992, PCT Pub. No. WO92/19074, PCT Pub. Date Oct. 29, 1992

PCT Filed Apr. 7, 1992, Ser. No. 938,231

Claims priority, application Japan, Apr. 10, 1991, 3-077686; Mar. 6, 1992, 4-049483; Mar. 10, 1992, 4-051466

Int. Cl.[6] H04N *7/30;7/64*

U.S. Cl. 348—398 **23 Claims**



1. An encoder which encodes a digital data by the variable-length encoding and the error-correction encoding, characterized in that said encoder comprises: means for converting a digital data to a variable length encoded data; means for partitioning a data string including the variable-length encoded data by a fixed length and adding an error-correcting code; means for obtaining an ignoring-bit-number data which is information of the number of bits after a partition used in the error-correction encoding to the initial bit of the variable-length encoded data; and means for time-axis multiplexing the obtained ignoring-bit-number data to the variable-length encoded data.

5,488,419

VIDEO COMPRESSION CODING AND DECODING WITH AUTOMATIC SUB-PIXEL FRAME/FIELD MOTION COMPENSATION

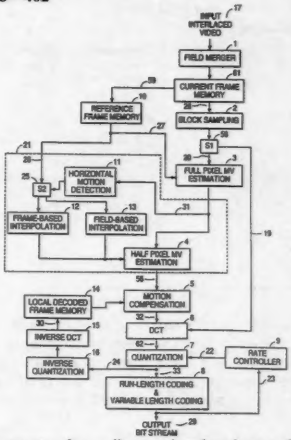
Lucas Y. W. Hui, and Siew-Tan Chong, both of Singapore, Singapore, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 15, 1993, Ser. No. 31,495

Claims priority, application Japan, Mar. 13, 1992, 4-054935

Int. Cl.[6] H04N *7/133;7/137*

U.S. Cl. 348—402 **16 Claims**



10. An apparatus for coding an interlaced scan digital video signal comprising:

block sampling means for partitioning each frame of an input of said interlaced scan digital video signal into blocks of pixel data;

switch means for designating each frame as a frame to be intra-coded or a frame to be predictive-coded;

motion vector estimation means for producing a full-pixel resolution motion vector of a block of a first frame which has been determined to be predictive-coded with reference to a reference frame;

detection means for checking the full-pixel resolution motion vector to determine whether said block of said first frame is to be compensated using a frame-based interpolation process or a field-based interpolation process;

interpolation means for subjecting said block of said first frame to only one of said frame-based interpolation process or said field-based interpolation process in accordance with whether said block is determined by said detection means to be compensated using said frame-based interpolation process or said field-based interpolation process respectively to obtain a sub-pixel resolution block;

motion compensation means for subjecting said sub-pixel resolution block to motion estimation and compensation to obtain a predicted block; and

coding means for coding each block of a second frame which has been determined to be intra-coded and said predicted block to obtain a coded bit stream;

wherein said detection means includes means for checking a magnitude of a horizontal component of said full-pixel resolution motion vector and determining that said block is to be compensated using said frame-based interpolation process if said magnitude is less than a predetermined threshold and that

said block is to be compensated using said field-based interpolation process if said magnitude is greater than said predetermined threshold.

5,488,420

COSMETICS FILTER FOR SMOOTHING REGENERATED PICTURES, E.G. AFTER SIGNAL COMPRESSING FOR TRANSMISSION IN A NARROWBAND NETWORK

Gisle Bjontegaard, Myrvoll, Norway, assignor to Teledirektoratets Forskningsavdeling, Norway

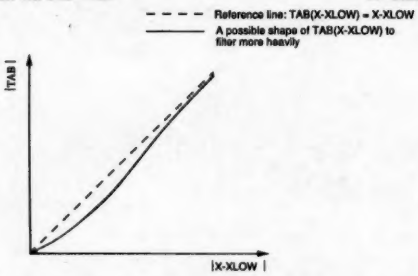
PCT No. PCT/NO92/00144, § 371 Date Apr. 20, 1994, § 102(e) Date Apr. 20, 1994, PCT Pub. No. WO93/05612, PCT Pub. Date Mar. 18, 1993

PCT Filed Sep. 8, 1992, Ser. No. 204,256

Claims priority, application Norway, Sep. 9, 1991, 91 3536

Int. Cl.[6] H04N *7/12*

U.S. Cl. 348—419 **17 Claims**



1. A cosmetics filter for use in smoothing pictures which are regenerated after signal compression and coding in connection with e.g. transmission of live pictures via a narrowband transmission medium, where picture signals are described by digitalized samples constituting picture points, said cosmetics filter comprising:

a digital lowpass filter having an input coupled to the input signal X and an output providing a lowpass-filtered signal XLOW;

a means for delaying having an input coupled to the input signal X and an output providing a delayed signal X;

a means of subtracting signals having a first input coupled to the lowpass filter, a second input coupled to the delay means and an output providing a difference signal (X−XLOW);

a table means having an address input coupled to the output of the signal subtracting means and an output providing a corresponding address content TAB(X−XLOW); and

an adder having a first input coupled to the table means, a second input coupled to said lowpass filter, and an output, whereby a total-filtered signal Y=XLOW+TAB(X−XLOW) is provided at the output from said adder.

5,488,421

INTERLACED-TO-PROGRESSIVE SCANNING CONVERTER WITH A DOUBLE-SMOOTHER AND A METHOD THEREFOR

Humor Hwang, and Myeong-hwan Lee, both of Kyungki, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea

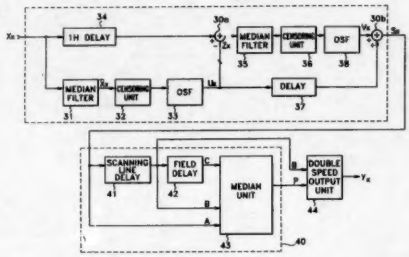
Filed Jun. 3, 1994, Ser. No. 253,856

Claims priority, application Rep. of Korea, Jun. 5, 1993, 1993-10176

Int. Cl.[6] H04N *7/01*

U.S. Cl. 348—448 **32 Claims**

1. An interlaced-to-progressive scanning converting apparatus for double-smoothing, wherein an interlaced scanning television



signal is converted into a progressive scanning television signal, said apparatus comprising:

means for median-filtering an input interlaced scanning signal;

means for censoring a signal beyond a predetermined bias value by receiving the signal median-filtered by said median-filtering means;

order statistics filtering (OSF) means for receiving the censored signal, setting weighing coefficients according to the received signal, filtering the censored signal, and outputting the result;

interpolation signal generating means for generating a line delayed signal and interpolation scanning line signal from the output signal of said OSF means; and

means for generating a progressive scanning signal from the signals generated by said interpolation signal generating means.

5,488,422

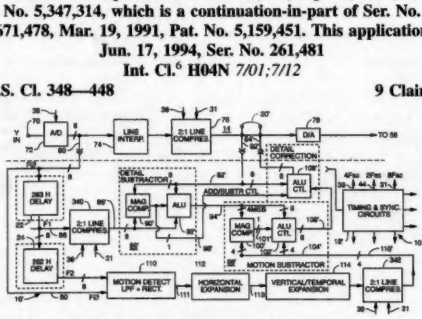
VIDEO SCAN CONVERTER INCLUDING THE MODIFICATION OF SPATIALLY INTERPOLATED PIXELS AS A FUNCTION OF TEMPORAL DETAIL AND MOTION

Yves C. Faroudja, 26595 Anacapa Dr., Los Altos Hills, Calif. 94022, and Charles A. Bialo, San Jose, Calif., assignors to Yves C. Faroudja, Los Altos Hills, Calif.

Continuation-in-part of Ser. No. 954,382, Sep. 30, 1992, Pat. No. 5,347,314, which is a continuation-in-part of Ser. No. 671,478, Mar. 19, 1991, Pat. No. 5,159,451. This application Jun. 17, 1994, Ser. No. 261,481

Int. Cl.[6] H04N *7/01;7/12*

U.S. Cl. 348—448 **9 Claims**



1. An expansible video scan converter comprising:

input means for receiving a video signal at a first scan rate,

output means for providing said video signal at a second scan rate,

a main signal path coupling said input means and said output means, said main signal path including

line interpolation means for interpolating pixels in original scan lines of said video signal and for putting out interpolated scan lines comprised of pixels interpolated in the spatial domain,

time scale modification means for combining original and interpolated scan lines into a video signal at the second scan rate, and

first optional further path insertion means between the line interpolation means and the time scale modification means, and

first removable connecting path means bypassing the first optional further path insertion means,

second optional further path insertion means between the input means and the line interpolation means,

second removable connecting path means bypassing the second optional further path insertion means, wherein said first and second removable connecting path means are opened, and

means for selectively modifying said spatial domain interpolated pixels as a function of temporal detail in said video signal coupled to said first and second optional further path insertion means, whereby said interpolated scan lines are both spatially and temporally interpolated.

5,488,423

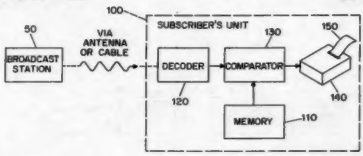
HOME COMMUNICATION METHOD AND APPARATUS

M. Jay Walkingshaw, Wainscott, N.Y.; Lorne R. Somerville, London, Great Britain; Anthony R. Esdaile, Selsdon, Great Britain, and David J. Stuart, East Grinstead, Great Britain, assignors to U.S. Narrow Networks, Inc., New York, N.Y.

Filed Nov. 17, 1994, Ser. No. 341,509

Int. Cl.[6] H04N *7/08*

U.S. Cl. 348—460 **10 Claims**



1. A non-interactive method for providing coupon and information printouts to a consumer in the consumer's premises wherein either or both coupon and information data is embedded in program broadcast signals, said method comprising the steps of

providing a consumer with means for detecting coupon and information data embedded in received broadcast signals, means for storing data identifying selected product and information categories desired by the consumer, and printing means,

receiving broadcast signals with embedded coupon and information data at said consumer's location,

detecting said coupon and information data from said received broadcast signals,

comparing the detected coupon and information data with data identifying selected product and information categories previously stored at the consumer's location, and

actuating said printing means to provide printouts of coupons and information upon correspondence of said selected product and information categories with the product and information categories of the detected coupon and information data.

5,488,424

Patent Not Issued For This Number

5,488,425

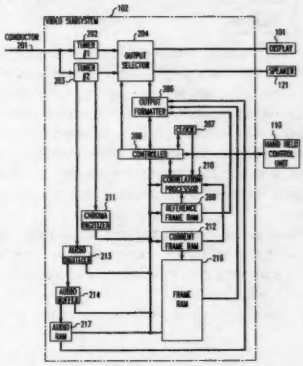
APPARATUS FOR STORING VIDEO INFORMATION BY RECOGNIZING VIDEO FRAMES

Gary J. Grimes, Thornton, Colo., assignor to AT&T Corp., Murray Hill, N.J.

Filed Dec. 22, 1993, Ser. No. 171,952

Int. Cl.[6] H04N *5/44*

U.S. Cl. 348—559 **21 Claims**



1. An apparatus for obtaining and displaying individual video frames from video programming material, comprising: means for designating a reference frame of the type of video frame to be obtained from the video programming material;

means for detecting and storing video frames that are substantially similar to the reference frame;

the means for detecting and storing comprises means for only storing one video frame of a program segment of the video programming material in which the reference frame is continuously detected;

means for displaying the stored video frames;

the means for designating comprises means for interacting with a user of the apparatus to detect the user designating the reference frame as a video frame from other video programming material which is displayed to the user is to be the reference frame where the other video programming material is similar to the video programming material; and

means for interacting with a user of the apparatus so that the user designates when the stored video frames are to be displayed.

5,488,426

CLOCK-SETTING APPARATUS AND METHOD UTILIZING BROADCASTING CHARACTER RECOGNITION

Bok H. Pack, Kyunggi-do, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed May 13, 1993, Ser. No. 61,663

Claims priority, application Rep. of Korea, May 15, 1992, 1992-8218

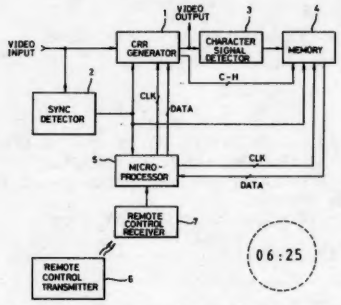
Int. Cl.[6] H04N *5/445;5/44*

U.S. Cl. 348—569 **3 Claims**

3. A clock-setting method comprising the steps of:

a) detecting if a synchronous signal separated from an inputted video signal is entered and then a clock-setting control signal is entered;

b) detecting if a position movement control signal of a character recognition region is entered within a preset time in order to



display the character recognition region as superimposed on the position of clock-displaying characters on a television screen when the clock-setting control signal is entered, and then moving the position of the character recognition region according to the inputted position movement control signal;

c) obtaining a character signal information in the character recognition region by sampling when the character recognition region is superimposed on the clock-displaying character position;

d) recognizing a clock-displaying numeral corresponding to the sampled character signal information by comparing the sampled character signal information with numerical data on a data base; and

e) setting a timer by a clock of the recognized numeral.

5,488,427

TELEVISION SYSTEM INCLUDING TELEVISION SET, AND ACCESSORY DEVICES CONTROLLED BY A SINGLE REMOTE CONTROL DEVICE

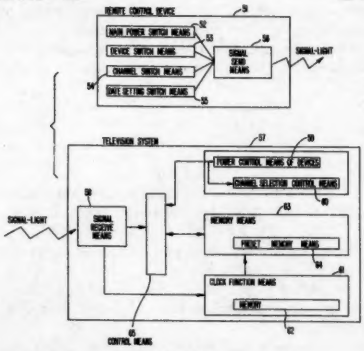
Kazuhiro Kayashima, Hirakata; Toshihiko Kurosaki, Kobe; Yo Egusa, Kyoto; Hiroshi Atuta, and Hiroshi Yamamoto, both of Katano, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 18, 1994, Ser. No. 229,455

Claims priority, application Japan, Apr. 16, 1993, 5-090111; Apr. 22, 1993, 5-095803

Int. Cl.[6] H04N *5/50;5/268*

U.S. Cl. 348—569 **15 Claims**



12. A television system comprising:

a television set having display means, a television tuner and a main power source,

a remote control device for sending a control signal to said television set, wherein said remote control device comprises:

main power switch means for turning on and off said main power source of said television set,

a channel switch means for generating a channel selection signal corresponding to channel selection information to select a channel on said television set and,

signal send means for coding and sending signals from said channel switch means,

said television system further comprising:

signal receive means for receiving and decoding said coded signals from said remote control device,

power control means for turning on and off said main power source responsive to said channel selection signal,

clock function means having a memory for storing calendar information and having a clock for providing a date and time,

memory means for storing said channel selection information in relation to the date and time, and

control means for controlling the power control means and channel switch means on the basis of said channel selection information corresponding to said date and time stored in said memory means.

5,488,428

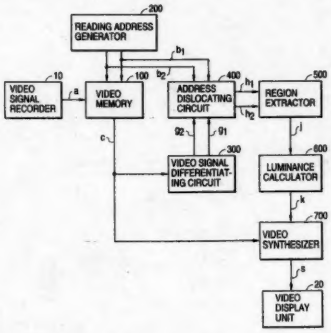
VIDEO SPECIAL EFFECT GENERATING APPARATUS

Tomoko Akashi, Moriguchi, and Norio Suzuki, Neyagawa, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 6, 1994, Ser. No. 319,007

Int. Cl.[6] H04N *5/262*

U.S. Cl. 348—578 **20 Claims**



1. A video special effect generating apparatus for processing an input video signal to generate a video special effect, comprising:

a video memory for storing therein the input video signal,

reading address generating means for generating a reading address composed of an x-direction component and a y-direction component for specifying a pixel of the input video signal, and for feeding the reading address to the video memory to read out a video signal from the video memory;

video signal differentiating means for calculating a differential value of the video signal read out from the video memory, and for outputting the differential value as a dislocation quantity;

address dislocating means for dislocating the reading address by an operation of the reading address and the dislocation quantity to produce a dislocation address;

region extracting means for generating a region signal showing a positional relation of a pixel specified by the dislocation address and a predetermined specific region on the basis of the dislocation address produced by the address dislocating means;

luminance calculating means for calculating a luminance correction value for correcting a luminance component of the video signal on the basis of the region signal; and

video synthesizing means for synthesizing the luminance correction value and the video signal read out from the video memory to obtain an output video signal.

5,488,429
VIDEO SIGNAL PROCESSOR FOR DETECTING FLESH TONES IN AM IMAGE

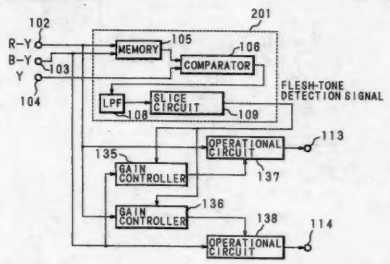
Kazuaki Kojima; Tetsuya Kuno; Hiroaki Sugiura, and Takeshi Yamada, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1992, Ser. No. 999,741

Claims priority, application Japan, Jan. 13, 1992, 4-003917; Jan. 14, 1992, 4-004453; Mar. 2, 1992, 4-044581; Apr. 27, 1992, 4-107451; Jun. 19, 1992, 4-161057; Jun. 19, 1992, 4-161058; Aug. 5, 1992, 4-208929; Aug. 5, 1992, 4-208930; Aug. 21, 1992, 4-222698; Aug. 21, 1992, 4-222699

Int. Cl.[6] H04N *9/68*

U.S. Cl. 348—653 **11 Claims**



1. A video signal processor receiving a luminance signal and color-difference signals as video signals, comprising:

first means for outputting a value based upon the received color-difference signals by referencing a predetermined table;

second means for comparing the output value with the luminance signal and outputting a result of the comparison as a flesh-tone detection signal; and

third means for controlling gains of the plurality of color-difference signals, independently, in accordance with the presence or absence of the flesh-tone detection signal.

5,488,430
MOTION DETECTION AND ESTIMATION APPARATUS AND METHOD THEREOF

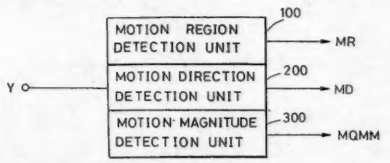
Sung H. Hong, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 22, 1992, Ser. No. 995,032

Claims priority, application Rep. of Korea, Dec. 23, 1991, 23998/1991

Int. Cl.[6] H04N *7/36*

U.S. Cl. 348—699 **27 Claims**



1. Motion detection apparatus, comprising:

motion region detection means for comparing absolute values of horizontal and vertical difference signal sums with respect to repective incoming signals and 1 frame-delayed signals and certain critical values with frame difference signals in order to detect a motion region;

motion direction detection means for performig an exclusive OR of frame difference signal sign bits and sum signal sign bits of horizontal and vertical difference signals with respect to respective incoming signals and 1 frame-delayed signals in order to detect left/right motion direction and up/down motion direction; and

motion magnitude detection means for detecting a horizontal motion magnitude and a vertical motion magnitude by ratios of frame difference signal absolute value sums and horizontal/vertical difference signal absolute value sums.

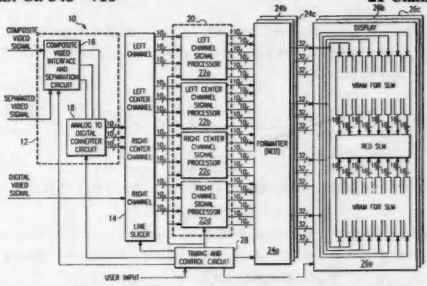
5,488,431
VIDEO DATA FORMATTER FOR A MULTI-CHANNEL DIGITAL TELEVISION SYSTEM WITHOUT OVERLAP

Robert J. Gove, Plano; Donald B. Doherty, Richardson; Scott D. Heimbuch; Paul M. Urbanus, both of Dallas, and Stephen W. Marshall, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 148,768, Nov. 4, 1993, abandoned. This application Mar. 20, 1995, Ser. No. 407,788

Int. Cl.[6] H04N *9/64*

U.S. Cl. 348—716 **21 Claims**



1. A video data formatter for a video system having a plurality of processing channels, comprising:

a line segment mapper responsive to the plurality of processing channels and operable to remove pixels from adjacent processing channels that are common to both channels, such that data for said common pixels is not repeated when said data is displayed, said line segment mapper further operable to divide each of said processing channels into two or more segments; and

a data format unit responsive to said line segment mapper and operable to coupled said segment so as to create at least one stream of video data for display.

5,488,432
VIDEO SIGNAL PROCESSING METHOD FOR CHANGING A VIDEO SIGNAL DISPLAY FORMAT

Jean-Claude Guillon, Gustheim, and Laurent Perdrieau, Illkirch, both of, France, assignors to Laboratoire Europeen de Recherches Electroniques Avancees Societe en Nom Collectif, Courbevoie, France

Continuation of Ser. No. 130,412, Oct. 1, 1993, abandoned, which is a continuation of Ser. No. 726,336, Jul. 5, 1991, abandoned. This application Dec. 21, 1994, Ser. No. 361,172

Claims priority, application France, Jul. 13, 1990, 90 08951

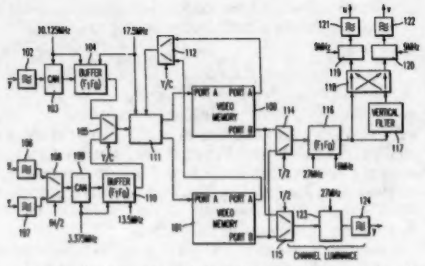
Int. Cl.[6] H04N *5/907;9/64*

U.S. Cl. 348—717 **16 Claims**

1. A processing method for a video signal coded in a form of K words, the video signal being written into and read from first and second frame memories each including an input port, and low and high speed output ports, comprising the steps of:

forming an input digital video signal from sets of M blocks with N blocks containing luminance data and M–N blocks containing corresponding chrominance data;

sequentially writing the blocks of luminance and chrominance data of the input digital video signal to the frame memories, wherein for a first frame the luminance data is written to the first frame memory and the corresponding chrominance data is written to the second frame memory, and for a next frame the luminance data is alternately written to the second frame memory and the corresponding chrominance data is alternatively written to the first frame memory, and for further



frames further sequentially alternating to which frame memory the luminance data and corresponding chrominance is written; and

reading from the output ports of the frame memories blocks containing the luminance data and corresponding chrominance data.

5,488,433

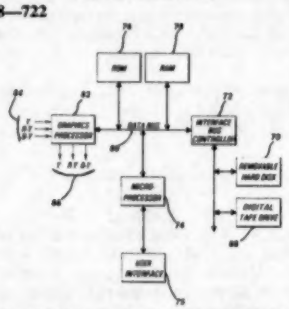
DUAL COMPRESSION FORMAT DIGITAL VIDEO PRODUCTION SYSTEM

Kinya Washino, 80 Hamilton Ave., Dunmont, N.J. 07624, and Barry H. Schwab, West Bloomfield, Mich., assignors to Kinya Washino, Mahwah, N.J.

Continuation-in-part of Ser. No. 298,104, Aug. 30, 1994, and Ser. No. 50,861, Apr. 21, 1993, Pat. No. 5,450,140. This application Mar. 1, 1995, Ser. No. 396,574

Int. Cl.[6] H04N *5/76*

U.S. Cl. 348—722 **39 Claims**



1. A digital audio/video production system adapted for use with an on-line video editing facility, the production system comprising:

a digital video recorder capable of simultaneously recording information representative of the same program source material, including correlated edit-time-code information, onto first and second removable storage media in first and second formats, respectively, the information in the first format being data-compressed relative to the information in the second format;

a programmed personal computer configured to receive the first removable storage medium, enabling an operator to edit the information representative of the program source material in the first format in off-line fashion so as to develop an edit decision list; and

means to transfer the edit decision list to an on-line video editing facility, the on-line editing facility being further configured to receive the second removable storage medium, whereby an operator of the on-line facility may edit the program source material in the second format using the edit decision list to create a final video production.

5,488,434

PICTURE ADJUSTING METHOD OF A COLOR TELEVISION AND ITS CIRCUIT

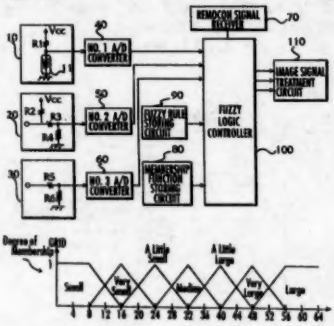
Tae-Hong Jung, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed May 14, 1992, Ser. No. 882,864

Claims priority, application Rep. of Korea, May 16, 1991, 91-7983

Int. Cl.[6] H04N *5/44;5/58;5/235*

U.S. Cl. 348—725 **19 Claims**



18. A picture adjusting method of a television, comprising the steps of:

providing sensed signals varying in dependence upon values obtained by sensing an ambient brightness in an environment surrounding the television, sensing a picture brightness of a visual display provided on a display screen of the television, and sensing a magnitude of video signals representative of an image within said visual display;

generating, in response to reception of a remote control signal from a remote controller, a detected distance signal upon detection of a viewing distance between said remote controller and said television;

determining adjusted values selected from a plurality of fuzzy, inference rules and membership functions representative of different levels of contrast, brightness and sharpness of the image in dependence upon the sensed signals representative of the ambient brightness, the picture brightness, the magnitude of said video signals and the detected distance signal; and

adjusting the contrast, the brightness and the sharpness of the image according to said adjusted values.

5,488,435

Patent Not Issued For This Number

5,488,436

LIQUID CRYSTAL PROJECTOR

Soon C. Choi, Kyonggi, and Ki U. Jeon, Seoul, both of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki, Japan

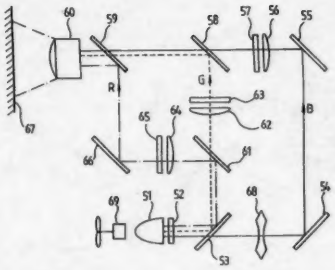
Filed Apr. 20, 1993, Ser. No. 49,448

Claims priority, application Rep. of Korea, Apr. 21, 1992, 92-6651; Sep. 15, 1992, 92-16760; Nov. 30, 1992, 92-22788

Int. Cl.[6] H04N *9/31*

U.S. Cl. 348—751 **15 Claims**

1. A liquid crystal projector which splits white light projected from a light source into first, second, and third color light components, light-intensity modulates said color light components, and synthesizes the light components to project the synthesized light components onto a screen, comprising:



first and third dichroic mirrors for transmitting only the first color light component and reflecting the second and third color light components;

a second dichroic mirror for reflecting only the third color light component and transmitting the first and second color light components; and

a fourth dichroic mirror for synthesizing the light components color-split by said first through third dichroic mirrors to send the synthesized light components to a projection lens, wherein, said first through fourth dichroic mirrors are disposed in such a manner that the projected light from said light source is reflected and transmitted via said first dichroic mirror, reflected light of said first dichroic mirror is transmitted and reflected by said second dichroic mirror, the reflected light of said second dichroic mirror reaches said fourth dichroic mirror, the transmitted light of said second dichroic mirror is reflected by said third dichroic mirror to reach said fourth dichroic mirror, and the transmitted light of said first dichroic mirror is transmitted via said third dichroic mirror to reach said fourth dichroic mirror,

wherein all of said dichroic mirrors separate one color light component from the other two color light components, said other two color light components being spectrally adjacent.

5,488,437

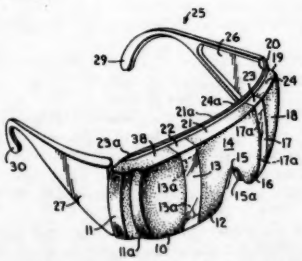
Patent Not Issued For This Number

5,488,438

VISION CONTROL GLASSES

William A. Cochran, 17905 W. 209th St., Spring Hill, Kans. 66083

Filed Oct. 11, 1994, Ser. No. 321,444
Int. Cl.[6] G02C *7/16*
U.S. Cl. 351—45 **6 Claims**



1. Eyeglasses for aiding bowling play by limiting peripheral vision comprising:

a pair of elongate front panels joined centrally normally substantially vertically overlying both eyes of any individual,

said front panels typically somewhat rectangular, so as to substantially abut, with its lower edge, the user's cheeks under the user's eyes,

normally vertical side edges on said front panels, said vertical side edges opaqued,

elongate, substantially normally vertical side panels pivotally mounted at their front ends, each to a side edge of said front panel, said side panels pivotally collapsible, one over the other, upon the rear side of the front panels and moveable outwardly therefrom substantially parallel to one another for use;

the front panel end edges and side panel pivotal connections thereto substantially opaqued;

user ear engagements on the free ends of said side panels;

the outer portions of said front panel opaqued from outwardly inwardly at least a limited distance thereof forming a non-opaque portion;

a nose receiving indentation formed in the lower joined center edge of said front panel;

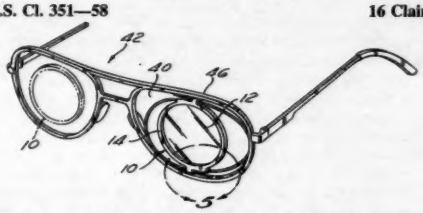
the portions of each said front panel above and adjacent to said indentation opaqued, formed together with the side edge and panel opaquing on each side, a substantially uniform width limited viewing panel clear of opaquing.

5,488,439

LENS HOLDER SYSTEM FOR EYEGLASS FRAME SELECTION

Alfred Weltmann, 1135 Thompson, Buffalo Grove, Ill. 60089

Filed Jun. 14, 1995, Ser. No. 490,337
Int. Cl.[6] G02C *7/08*
U.S. Cl. 351—58 **16 Claims**



1. A lens holder system for temporarily holding a prescription lens in the opening of eyeglass frames having perimeter grooves, comprising lens holders, each having:

a prescription lens;

a prescription lens encircling portion;

a pair of resilient, spring wire means with first and second end regions, said spring wires being fixably attached by said first end regions to opposing sides of said prescription lens encircling portion; and

a pair of guide means positioned on said lens encircling portion distant from the points of attachment of said first end regions of said spring wire means to said lens encircling portion;

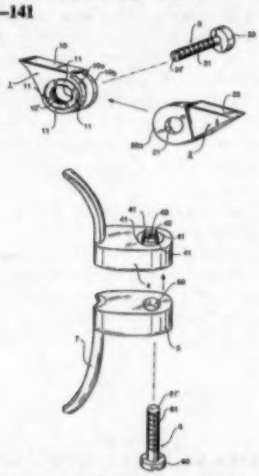
wherein each of said second end regions of said spring wires are slidably engaged with one of said guide means and said second end regions of said spring wires have terminal stop means to prevent said second end regions from being withdrawn from said guide means, said pair of spring wire means forming a pair of spring wire loops which extend from opposite sides of the lens encircling portion, and which tend to expand outwardly, and which can be contracted and expanded as desired to temporarily retain the prescription lens in the eyeglass frame during a eyeglass frame selection process.

5,488,440

CLAMP TYPE SCREW LOOSENING PREVENTION MECHANISM FOR GLASSES

Mikihito Fukuoka, Sabae, Japan, assignor to Fukuoka Seimitu Kabushiki Kaisha, Fukui, Japan

Continuation-in-part of Ser. No. 907,045, Jul. 1, 1992, abandoned. This application Sep. 8, 1994, Ser. No. 301,402
Claims priority, application Japan, Feb. 4, 1992, 4-54375
Int. Cl.[6] G02C *5/00*
U.S. Cl. 351—141 **7 Claims**



1. A clamp type screw loosening prevention mechanism for eyeglasses parts comprising:

two eyeglasses parts each of which has a piercing hole having an aligned axis, which parts are to be screw-joined to each other; and

a male screw which pierces through said piercing holes of said eyeglasses parts and screw-joins the eyeglasses parts; wherein

at the outside end surface of one of said eyeglasses parts where an end part of a threaded rod of said male screw is adapted for exiting, a split cone projection is permanently attached, the split cone projection having a bored hole extending therethrough, the bored hole having an exit end away from the outside end surface of said one of said eyeglasses parts, and at an inside wall of the bored hole, a female screw thread is provided which gradually reduces in inside diameter towards the exit end of the bored hole; and

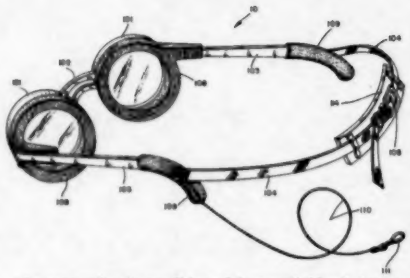
the end part of said threaded rod which is screwed into the piercing holes from a side opposite of the split cone projection is firmly joined to said female screw thread inside the split cone projection in a clamped condition by a spring-back resiliency of said split cone projection.

5,488,441

ADJUSTABLE EYEGLASSES RETAINER

Thomas W. Pomatti, 1127 15th St., Santa Monica, Calif. 90403

Continuation-in-part of Ser. No. 839,364, Feb. 21, 1992, abandoned. This application Sep. 20, 1993, Ser. No. 124,769
Int. Cl.[6] G02C *3/00*
U.S. Cl. 351—156 **18 Claims**



1. An eye-glass frame arrangement for holding a lens in front of each eye of the user comprising, in combination;

a plurality of lens supports fabricated of semi-rigid material, the shape of the internal periphery surface of said support being adapted to hold one of said lens upon the condition of said lens being popped into said support;

a nose bridge fabricated of semi-flexible material and mounted to said lens supports so that one lens is in front of each eye of the user under the condition of the nose bridge being mounted on the nose of the user;

a plurality of temple bows fabricated of semi-flexible material and mounted on said lens supports in a position engagable with the users ears;

eye pads fabricated of closed cell foam and mounted to said lens supports in a position facing the eye sockets of the user; and,

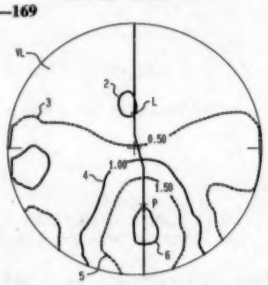
a retaining strap arrangement mountable to the ends of the temple bows remote from the lens supports and having an adjustable fastener means whereby the user may tighten said retaining strap to deform the frame arrangement from a normal position away from the eye sockets to a goggle position with said eye pads engaged with the users eye sockets.

5,488,442

PROGRESSIVE MULTIFOCAL OPHTHALMIC LENS

Christian Harsigny, Yerres; Christian Miege, Paris; Jean-Pierre Chauveau, Paris, and Françoise Ahsbahs, Paris, all of, France, assignors to Essilor International, Creteil, France

Filed Nov. 18, 1993, Ser. No. 154,336
Claims priority, application France, Dec. 11, 1992, 92 14929
Int. Cl.[6] G02C *7/06*
U.S. Cl. 351—169 **15 Claims**



1. A progressive multifocal ophthalmic lens comprising an aspherical surface having a mean sphere and a cylinder at every point thereof, said surface comprising:

a distance vision portion including a control point for distance vision,

a near vision portion including a control point for near vision,

an intermediate vision portion between said distance vision portion and said near vision portion,

a principal meridian of progression passing through the said three portions, the said lens has a power additional value defined as the variation in mean sphere between said distance vision control point on said distance vision portion and said near vision control point on said near vision portion, and in which:

the maximum value of the gradient of the mean sphere of said surface is located at a part of said principal meridian of progression that is situated within said intermediate vision portion,

and, over the whole of said aspherical surface of the lens, the ratio of the gradient of the cylinder of said surface to said

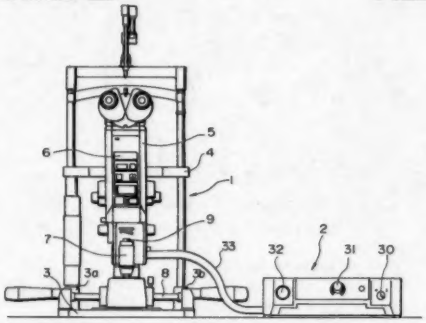
power addition value has a value that is less than a coefficient k_{cmax} equal to 0.165 mm^{-1}.

5,488,443

PORTABLE LASER APPARATUS FOR OPHTHALMOLOGICAL OPERATION

Yasuo Ota, Gamagori; Masanori Enomoto, Nishio, and Hitoshi Abe, Okazaki, all of, Japan, assignors to Nidek Co., Ltd., Gamagori, Japan

Filed Oct. 27, 1993, Ser. No. 141,539
Claims priority, application Japan, Nov. 7, 1992, 4-322386
Int. Cl.[6] A61B *3/10*
U.S. Cl. 351—221 **5 Claims**



1. A portable laser apparatus for ophthalmological operation, comprising:

an optical unit, said optical unit including

i) a slit-lamp microscope unit with an observation optical system for observing an eye to be operated,

ii) a laser light source secured to said slit-lamp microscope unit,

iii) a laser light guiding optical system for guiding treatment light emitted from said laser light source toward an affected part of the eye to be operated within an observation visual field of said slit-lamp microscope unit; said portable laser apparatus further comprising

a power source housing for containing a power source for supplying electrical power to said optical unit, said power source housing being disposed on a table;

a base with a friction plate which is attached to a top surface of said power source housing;

a slide device which includes a joy stick and slides said slit-lamp microscope unit with respect to said base by operating said joy stick; and

conductor cables for connecting said slit-lamp microscope unit and said laser light source to said power source;

said laser apparatus being made easy to carry.

5,488,444

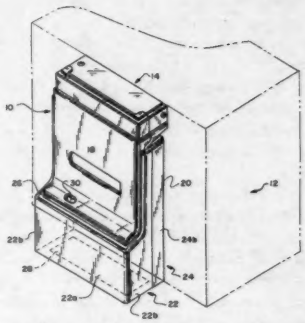
CAMERA BACK ADAPTER AND METHOD

Philip R. Norris, North Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 8, 1994, Ser. No. 302,220
Int. Cl.[6] G03B *17/50*
U.S. Cl. 354—83 **13 Claims**

1. Apparatus adapted to be mounted on an image recording apparatus and adapted for removably receiving therein a transport assembly which houses a photographic film cassette containing at least an instant developable film, the transport assembly being actuatable so that the film unit can be exposed while in the cassette, said apparatus comprising:

a housing assembly including means for securing said housing assembly to an image recording apparatus; receiving means



for removably receiving therein a transport assembly containing a photographic film cassette; and an exposure aperture which allows the film unit to be exposed by the image recording apparatus when received within said receiving means;

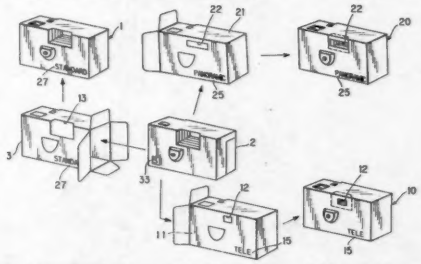
blocking means coupled to said housing assembly and being operable in a first mode for normally blocking said exposure aperture, and being operable in a second mode in response to insertion of the transport assembly into said receiving means so as to unblock said aperture and allow exposure of a film unit, said blocking means being returnable to said first mode to reblock said aperture prior to removal of the transport assembly from said receiving means.

5,488,445

LENS-FITTED PHOTOGRAPHIC FILM PACKAGE AND PRODUCTION METHOD THEREFOR

Nakao Oi, Kanagawa, and Hiroshi Komatsuzaki, Tokyo, both of, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 172,247, Dec. 23, 1993, abandoned, which is a division of Ser. No. 849,536, Mar. 11, 1992, Pat. No. 5,343,265. This application Mar. 20, 1995, Ser. No. 406,802
Claims priority, application Japan, Mar. 11, 1991, 3-70567
Int. Cl.[6] G03B *17/24*
U.S. Cl. 354—106 **29 Claims**



1. A lens-fitted photographic film package which contains a roll of photographic film, and has a taking lens, an exposure mechanism and a film winding mechanism which are adapted to photograph picture frames of a standard size, and which has a construction unsuitable for repeated film loading, said lens-fitted photographic film package comprising:

a light-tight cassette for winding up said photographic film therein after exposure;

visible indicia for indicating only one photography type other than standard photography type, said visible indicia being disposed on an outer surface of said lens-fitted photographic film package;

second indicia for indicating the same photography type as the type indicated by said visible indicia, said second indicia being prerecorded on one of said light-tight cassette and said photographic film prior to assembly of said photographic film in said film package and being adapted to be utilized for determining a format of photographic prints to be made from said standard size photographic picture frames in correspondence with the photography type indicated by said visible indicia; and

a view field defining element fixedly disposed for defining a single viewed field through a standard size viewfinder on said package, such that said viewed field corresponds to a partial area of said standard size photographic picture frame to be printed corresponding to said photography type other than standard photography type, said second indicia having information of said partial area to be used for making said photographic prints.

5,488,446

INDICATOR WITHIN FINDER OF SINGLE LENS REFLEX CAMERA

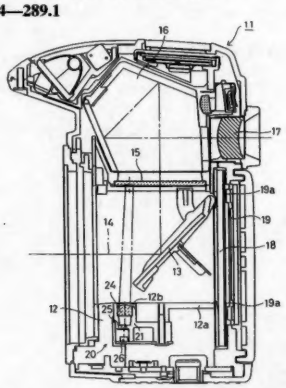
Tadayuki Kirigaya; Kaoru Imakyure; Hiroyasu Ozaki, and Hiroshi Kurei, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1994, Ser. No. 230,148

Claims priority, application Japan, May 14, 1993, 5-112691

Int. Cl.[6] G03B *17/00*

U.S. Cl. 354—289.1 **13 Claims**



1. An indicating apparatus within a finder of a single lens reflex camera, comprising:

a mirror which reflects light of an object transmitted through a photographing lens to form an object image on a focusing plate;

a finder optical system through which an image of the object formed on a focusing plate is viewed;

a mirror box which supports a mirror; and,

a photographing information projector provided on the lower portion of the mirror box to project a bundle of rays onto the focusing plate to form an image of the photographing information in a manner such that the bundle of rays is projected without interference from the mirror.

5,488,447

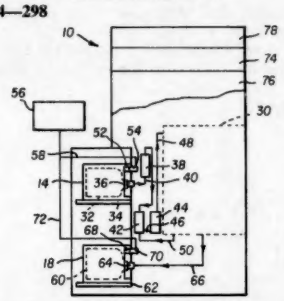
SYSTEM AND METHOD FOR TRANSFERRING A FLUID BETWEEN A CONTAINER AND AN ASSOCIATED APPARATUS FOR USING THE FLUID

David L. Patton, Webster; Clark E. Harris, Fairport, and John H. Rosenburgh, Hilton, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1994, Ser. No. 363,102

Int. Cl.[6] G03D *13/00*

U.S. Cl. 354—298 **16 Claims**



1. A system for delivering fluid between at least one container for fluid and an associated apparatus for using fluid, the system comprising:

at least one container for fluid;

a first status code member associated with the container to indicate whether the container has been opened;

a second status code member associated with the container to indicate whether or not the container has been emptied of a first fluid;

a third status code member associated with the container to indicate a type of the first fluid;

a first sensor associated with the apparatus to cooperate with the first status code member and produce a first signal indicative of an opened or unopened container;

a second sensor associated with the apparatus to cooperate with the second status code member and produce a second signal indicative of a container emptied of a first fluid;

a third sensor associated with the apparatus to cooperate with the third status code member and produce a third signal indicative of a type of fluid; and

a controller for receiving and processing the first to third signals to determine whether the proper container has been installed to deliver the first fluid to the apparatus.

5,488,448

FILM CARTRIDGE RECOVERY TOOL

Thomas C. Merle; Dale W. Ryan, both of Rochester; Walter C. Slater, Prattsburg; David L. Rowden, Rochester; Gerald F. Sherman, Jr., LeRoy, and Alfonso Ianni, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 9, 1994, Ser. No. 336,599

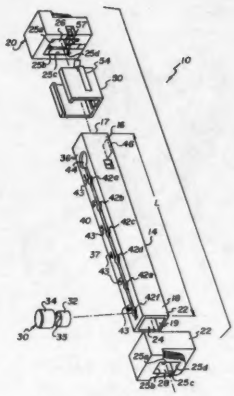
Int. Cl.[6] G03D *17/00;13/14*

U.S. Cl. 354—313 **30 Claims**

1. A recovery tool for receiving film cartridges and for storing said cartridges in a predetermined sequence, said recovery tool comprising:

a generally tubular member having a receiving chamber designed to hold a plurality of film cartridges in a single column, one cartridge above the other, said chamber having an upper end and a lower end, an inlet/outlet opening is provided at the upper end of said tubular member for allowing film cartridges to be inserted into or removed from said chamber; and

means for limiting the number of film cartridges that can be placed into said receiving chamber.



5,488,449

INFINITE-DISTANCE DETECTING CIRCUIT FOR AN AUTO-FOCUS SYSTEM

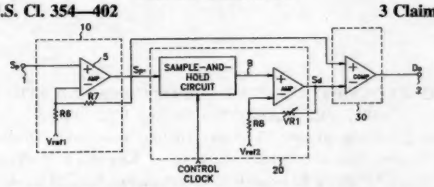
Ho-gul Joo, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jan. 11, 1994, Ser. No. 180,082

Claims priority, application Rep. of Korea, Jan. 11, 1993, 93-244

Int. Cl.[6] G03B *13/36*

U.S. Cl. 354—402 **3 Claims**



1. An infinite-distance detecting circuit for use in a camera auto-focus system which receives a position detection signal from a position status detector, said position detection signal varying in accordance with an object-to-camera distance, and said circuit comprising:

an amplifier section receiving and amplifying said position detection signal;

a reference signal generation section sampling said amplified position detection signal, holding said sample as a reference signal level, and amplifying said reference signal to produce an infinite-distance-determining reference signal; and

a comparator comparing said amplified position detection signal with said infinite-distance-determining reference signal, and producing an output indicative of whether the position detection signal is less than a predetermined reference value.

5,488,450

IMAGE PRINTER

Toru Tanibata, Wakayama, Japan, assignor to Noritsu Koki, Co., Japan

Filed Mar. 17, 1994, Ser. No. 214,612

Claims priority, application Japan, Mar. 18, 1993, 5-057642; Jun. 11, 1993, 5-140249

Int. Cl.[6] G03B *27/72*

U.S. Cl. 355—38 **18 Claims**

1. An image printer comprising:

a projection-exposure section for projecting an image born on a film onto a photosensitive material;

an image-exposure section for exposing the photosensitive material based on image information obtained from said film, said

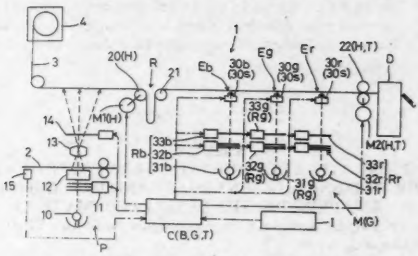


image information comprising a plurality of image areas each including color data relating to a plurality of colors; and

transport means for transporting the photosensitive material along a transport path through the projection-exposure section and the image-exposure section;

wherein said image-exposure section includes:

a plurality of exposure means for dividing the image information into a plurality of lines and exposing the photosensitive material with exposing colored light according to the color data;

moving means for moving said plurality of exposure means and said photosensitive material relative to each other in a direction perpendicular to said lines, and

moving-exposure control means for controlling operations of said exposure means and said moving means, said exposure control means being capable of effecting a moving exposure control in which said plurality of exposure means respectively effect exposure operations thereof in a parallel manner.

5,488,451

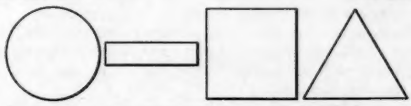
METHOD OF PRODUCING MULTIDIMENSIONAL LITHOGRAPHIC SEPARATIONS FREE OF MOIRE INTERFERENCE

Timothy P. Goggins, Nashota, Wis., assignor to National Graphics, Inc., Brookfield, Wis.

Filed May 3, 1994, Ser. No. 237,074

Int. Cl.[6] G03B *27/32;35/14*

U.S. Cl. 355—77 **10 Claims**



1. A method of producing a multidimensional lithographic separation void of moire and screen interference, the separation comprising a plurality of segments created from a plurality of electronic frames and from which a multidimensional lithograph can be produced and joined to a lenticular lens of a predetermined line count, the method comprising the steps of:

A. Creating a plurality of electronic frames;

B. Ordering the frames into a desired sequence;

C. Rasterizing each frame at a nonbinary pixel resolution according to the formula

$$\text{resolution} = l \text{ times } f$$

in which l is the lenticular line count and f is the number frames in the lithographic separation;

D. Compressing each frame such that each frame is compressed according to the formula

$$\text{Compression} = 1/f$$

in which f is the number of frames in the separation;

E. Converting the nonbinary pixels of the compressed frames to individual color plates of binary pixels;

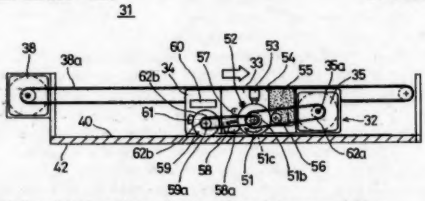
F. Interlacing the frames in the desired sequence of step (B);
G. Outputting the interlaced frames to an imaging device; and
H. Producing a lithographic separation from the imaging device of step G.

5,488,452

SERIAL TYPE ELECTROPHOTOGRAPHY PRINTER FOR FORMING A LATENT IMAGE AND DEVELOPING AND PRINTING THE DEVELOPED IMAGE

Ryoichi Iwama, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 21, 1994, Ser. No. 278,324
Claims priority, application Japan, Sep. 16, 1993, 5-230444
Int. Cl.[6] G03G *21/00*
U.S. Cl. 355—202 **10 Claims**



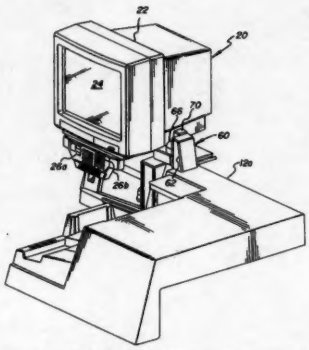
1. A serial type electrophotography printer comprising:
transport means for transporting a recording sheet in a transport direction;
a carriage including process means and fixing means, said process means including an image bearing member rotatable about a rotary axis parallel to the transport direction of the recording sheet and a toner developing a latent image formed by charging the image bearing member, said fixing means including a rotatable fixing member and heating means for heating the fixing member, said fixing member fixing a developed image which is transferred onto the recording sheet from the image bearing member;
driving means for rotating the image bearing member and the fixing member when said carriage is moved to carry out developing, transfer and fixing processes with respect to the recording sheet, and for rotating at least one of the image bearing member and the fixing member during a predetermined time other than the time when said carriage is moved to carry out the developing, transfer and fixing processes;
transfer means, confronting said carriage via the recording sheet in a main scan direction of said carriage, for transferring the developed image on the image bearing member onto the recording sheet; and
moving means for moving said carriage in the main scan direction which is perpendicular to the transport direction of the recording sheet.

5,488,453

OPERATOR CONTROL INTERFACE MOUNTING MECHANISM

Brian R. Labudde, Rochester, and Frank Hacknauer, Honeoye Falls, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 29, 1994, Ser. No. 283,010
Int. Cl.[6] G03G *21/00*
U.S. Cl. 355—202 **22 Claims**



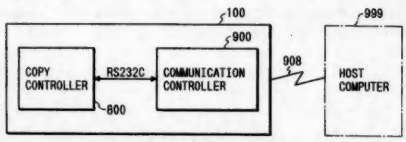
1. A mechanism for mounting a user control interface for inputting instruction signals to a logic and control unit controlling the operation of functional elements within the housing of a reproduction apparatus for movement relative to the reproduction apparatus housing, said mounting mechanism comprising:
a user control interface support platform;
means for slidably supporting said platform for movement, relative to said reproduction apparatus housing, to a home position and a position spaced from said home position where said user control interface is readily accessible by a user; and
means for automatically moving said platform to its home position when a portion of said reproduction apparatus housing is opened to provide access to the interior of said housing.

5,488,454

CONTROL OF EQUIPMENT AND OF COMMUNICATION WITH PLURAL UNITS OF EQUIPMENT

Taisei Fukada, Tokyo; Masanori Miyata, Yokohama; Hideki Adachi; Shinichi Nakamura, both of Kawasaki; Naoyuki Ohki; Tokuharu Kaneko, both of Yokohama; Satoshi Kuroyanagi; Hiroshi Ozaki, both of Tokyo, Japan; Hisatsugu Tahara; Satoshi Kaneko, both of Kawasaki, and Mitsuharu Takizawa, Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 212,387, Mar. 14, 1994, abandoned, which is a continuation of Ser. No. 868,342, Apr. 15, 1992, abandoned. This application Sep. 14, 1994, Ser. No. 305,820
Claims priority, application Japan, Apr. 18, 1991, 3-085605; Apr. 18, 1991, 3-085614; Apr. 18, 1991, 3-085617
Int. Cl.[6] G03G *15/00*
U.S. Cl. 355—202 **38 Claims**



6. An equipment control unit comprising:
first storage means for storing data;
equipment control means for controlling operation of an equipment based on the data stored in said first storage means;
second storage means for storing data;
communication control means for controlling transmission and reception of data to and from an external device based on the data stored in said second storage means; and
data transfer means for holding identical contents of said first storage means and said second storage means.

5,488,455

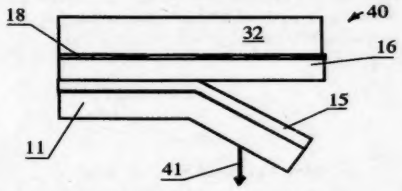
ELECTROGRAPHICALLY PRODUCED IMAGED ARTICLE

Douglas A. Cahill, Belchertown; Donald A. Brault, Granby; Richard S. Himmelwright, Wilbraham, and Dene H. Taylor, Holyoke, all of Mass., assignors to Rexam Graphics, South Hadley, Mass.

Division of Ser. No. 219,395, Mar. 29, 1994, which is a continuation-in-part of Ser. No. 115,563, Sep. 3, 1993, Pat. No. 5,363,179, which is a continuation-in-part of Ser. No. 42,278, Apr. 2, 1993, abandoned. This application May 30, 1995, Ser. No. 453,383

Int. Cl.[6] G03G *15/00*

U.S. Cl. 355—202 **12 Claims**



1. An imaged article comprising in the order given:

1) a receptor substrate;

2) a toned image;

3) a single, continuous transparent layer comprising an adhered combined adhesive and dielectric layer which is substantially tack-free at ambient temperature and which has a dielectric constant of about 2 to 5, wherein the image and transparent layer have been placed on the substrate by a process comprising the steps of:

A) electrographically depositing an electrostatic charge in image-wise fashion onto an image receptive surface of an electrographic element comprising in the order given;

i) a conductive base,

ii) a release layer, and

iii) the single, transparent, combined dielectric and adhesive layer, wherein said combined dielectric and adhesive layer is substantially tack-free at ambient temperature, and is activated at a temperature which is above ambient temperature of the electrographic element, and has a dielectric constant of about 2 to 5, the image receptive surface being an exposed surface of said single combined dielectric and adhesive layer, to form a latent image;

B) applying a toner layer onto said electrostatic charge to produce a toned image;

C) contacting said toned image and combined adhesive and dielectric layer with a surface of the receptor substrate at a temperature sufficient to activate the combined dielectric and adhesive layer to adhere the electrographic element to the substrate and

D) removing the conductive base and the release layer from the combined dielectric and adhesive layer of the electrographic element adhered onto the receptor substrate following step (C), to form the imaged article.

5,488,456

METHOD AND APPARATUS FOR DETECTING WHICH SIDE OF A RECORDING SHEET CONTAINS A COATING

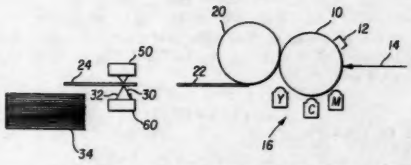
Feraydoon S. Jamzadeh, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 15, 1993, Ser. No. 168,003

Int. Cl.[6] G03G *15/00;* **G01N** *21/64*

U.S. Cl. 355—203 **5 Claims**

1. A detecting device for an image-recording sheet having front and rear surfaces that have coatings having an ultraviolet-absorbing material that fluoresces light at a higher wavelength on the front surface, said detecting device comprising:



means for directing an ultraviolet light against both surfaces of the recording sheet;

means for measuring the amount of light at said higher wavelength from each surface;

means for comparing the amount of light at said higher wavelength from each surface to determine which surface fluoresced light at a higher wavelength; and

means for determining if the recording sheet is properly oriented by determining if the light at said higher wavelength was emitted from the front surface.

5,488,457

IMAGE FORMING APPARATUS WITH POWER SOURCE CONTROL

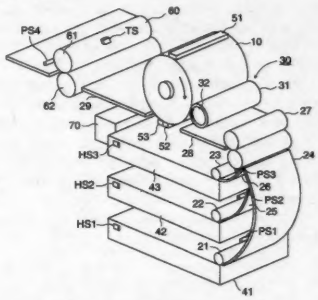
Kiyohari Nakagama, and Mitsugu Nemoto, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Aug. 10, 1994, Ser. No. 288,044

Claims priority, application Japan, Sep. 1, 1993, 5-217656

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—203 **6 Claims**



1. An image forming apparatus comprising:

a high voltage power source;

a plurality of sheet storing cassettes for storing recording sheets therein;

a moisture sensor for sensing moisture;

transfer means for transferring an image to the recording sheets by applying transfer current generated at the high voltage power source;

cut-off period estimating means for estimating a cut-off period of the high voltage power source based on a combination of surface temperature of a fixing roller and heat radiation of said fixing roller during an elapsed time period;

measuring means for measuring an elapsed time period after one of said sheet storing cassettes is mounted onto said apparatus;

moisture content conversion means for converting the moisture sensed by said moisture sensor and said elapsed time period into moisture content data; and

a control circuit for controlling an output of said high voltage power source based on said moisture content data.

5,488,458

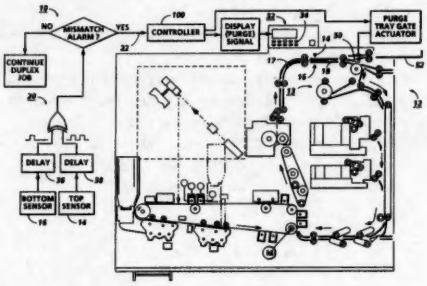
DUPLEX PRINTING INTEGRITY SYSTEM

Lawrence R. Benedict, Rushville, and Gaith O. Zayed, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 8, 1995, Ser. No. 438,139

Int. Cl.[6] G03G *15/00*

U.S. Cl. 355—206 **8 Claims**



1. In a duplex printing integrity system for insuring that correctly matching pages are being printed by a duplex printer on the opposing first and second sides of the printed duplex document sheets, wherein said duplex printer has a duplex loop path for circulating sheets printed on one side back to be printed on their opposite side, and an output path for feeding out the duplex document sheets after they have been printed on both sides, said printer being operable to selectively print marks on selectable areas of said duplex document sheets, the improvement comprising:

a first optical sensor positioned in said output path of said duplex printer positioned to line scan said first sides of said printed duplex document sheets as said printed duplex document sheets are fed past said first optical sensor;

a second optical sensor positioned in said output path of said duplex printer positioned to line scan said second sides of said printed duplex document sheets as said printed duplex document sheets are fed past said first optical sensor; and

said opposing first and second sides of a sequence of respective said printed duplex document sheets being printed with correspondingly spaced and parallel said print marks, but with different spacings of said marks on said sheets for different said sheets in said sequence.

5,488,459

IMAGE BEARING MEMBER HAVING AN ASYMMETRICALLY WEIGHTED BASE, PROCESS CARTRIDGE AND IMAGE FORMING APPARATUS

Tadayuki Tsuda; Kazumi Sekine; Isao Ikemoto, all of Kawasaki; Kazushi Watanabe, Yokohama; Yoshikazu Sasago; Yasushi Shimizu, both of Tokyo; Shinya Noda, Yokohama, and Kazunori Kobayashi, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1993, Ser. No. 84,489

Claims priority, application Japan, Jun. 30, 1992, 4-194661

Int. Cl.[6] G03G *5/00*

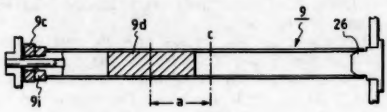
U.S. Cl. 355—211 **33 Claims**

1. An image bearing member contacting with a charge member to which a vibrating voltage can be applied, comprising:

an image bearing layer capable of bearing an image thereon;

a base for supporting said image bearing layer;

a drive force transmitting portion disposed at one end of said image bearing member in a generatrix direction thereof; and



a weight portion provided to be contacted with substantially all of an inner peripheral surface of said base, said weight portion being arranged so that a center thereof is offset from a center of said base toward said drive force transmitting portion in the generatrix direction.

5,488,460

Patent Not Issued For This Number

5,488,461

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER AND ELECTROPHOTOGRAPHIC APPARATUS USING THE SAME

Shintetsu Go; Yoshio Kashizaki, both of Yokohama; Koichi Suzuki, Kawasaki; Kazuma Sato, Yokohama, and Akira Shimada, Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 148,337, Nov. 8, 1993, abandoned. This application Mar. 6, 1995, Ser. No. 400,007

Claims priority, application Japan, Nov. 6, 1992, 4-297249

Int. Cl.[6] G03G *5/00;7/00*

U.S. Cl. 355—211 **34 Claims**

1. An electrophotographic photosensitive member comprising: a support, and an intermediate layer and a photosensitive layer disposed on the support in this order; wherein the intermediate layer comprises a coated powder having a resistivity of 0.1 to 1,000 ohm.cm comprising barium sulfate fine particles coated with a coating layer comprising tin oxide having a reduced oxygen content.

5,488,462

ELECTROPHOTOGRAPHIC APPARATUS HAVING DEVELOPING DEVICE WITH SEALS FOR PREVENTING TONER LEAKAGE

Masaaki Ishikawa; Michihisa Iguchi; Hiroshi Hashizume; Tetsuya Nakamura; Kouichirou Satou; Yoshiaki Okano; Hirotaka Fukuyama; Satoshi Katagata; Takashi Ishikawa; Seiji Arai; Chinobu Sakai, and Takahito Kabai, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

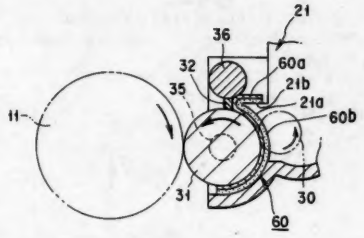
Division of Ser. No. 113,694, Aug. 31, 1993. This application Jun. 10, 1994, Ser. No. 258,186

Claims priority, application Japan, Aug. 31, 1992, 4-231675; Aug. 31, 1992, 4-257321; Aug. 31, 1992, 4-257322; Sep. 25, 1992, 4-256780

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—215 **10 Claims**

1. A developing device for developing an electrostatic latent image formed on a surface of a photosensitive member by using



toner which is charged by friction between a developing roller and a toner restriction member to have a predetermined polarity, the developing device comprising:

a casing including an inner wall facing side end portions of a surface of the developing roller, the inner wall being located at an upstream side of conveyance of toner with respect to the toner restriction member; and

a seal member disposed between the side end portions of a surface of the developing roller and said inner wall of said casing, the seal member comprising a material which is charged to have the predetermined polarity by friction with the developing roller.

5,488,463

IMAGE FORMING APPARATUS TO FORM IMAGES ONTO A SHEET A PLURALITY OF TIMES

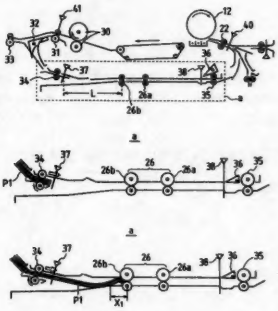
Mitsuo Nimura, Kawasaki; Kazuhiko Hirooka, Tokyo; Shokyo Koh, and Masao Watanabe, both of Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 7, 1994, Ser. No. 193,573

Claims priority, application Japan, Feb. 8, 1993, 5-041813

Int. Cl.[6] G03G *15/00*

U.S. Cl. 355—322 **29 Claims**



1. An image forming apparatus comprising:

image forming means for forming an image onto a sheet which is conveyed;

first and second conveying means for again conveying the sheet from said image forming means to said image forming means, said second conveying means stopping a first one of the sheets conveyed by said first conveying means at a first predetermined position and, after a second one of the sheets which is conveyed subsequently to the first sheet by said first conveying means is conveyed to a second predetermined position on the first sheet, said second conveying means conveying the first and second sheets in a partially overlapped state and separating the first sheet and supplying the separated first sheet to said image forming means; and

detecting means, positioned at a first distance from said second conveying means, for detecting a front edge of a sheet which is conveyed to said first conveying means,

wherein, in a state where said first conveying means is conveying the first sheet and said second conveying means is stopped, after the first sheet is conveyed by said first conveying means by a first predetermined amount after the front edge of the first sheet has been detected by said detecting means, the first predetermined amount being larger than the first distance, said second conveying means conveys the first sheet and stops the first sheet at the first predetermined position, and

wherein, in a state where said first conveying means is conveying the second sheet and said second conveying means is stopped, after the second sheet is conveyed by said first conveying means by a second predetermined amount after the front edge of the second sheet has been detected by said detecting means, the second predetermined amount being larger than the first distance and being different from the first predetermined amount, said second conveying means conveys the first and second sheets.

5,488,464

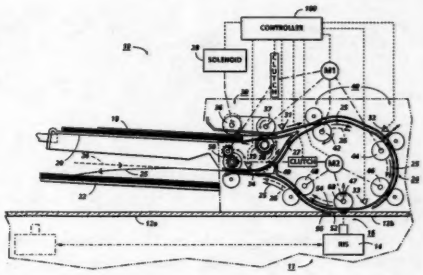
CONSTANT VELOCITY TRANSPORT FOR ELECTRONIC DOCUMENT IMAGING

Stephen J. Wenthe, Jr., West Henrietta; Margaret C. Plain, Rochester, and Robert F. Rubscha, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 31, 1994, Ser. No. 251,064

Int. Cl.[6] G03B *27/32;* **H04N** *1/12;* **G03G** *15/00*

U.S. Cl. 355—233 **7 Claims**



1. In a document handler for sequentially feeding document sheets over an imaging platen to be imaged at a constant velocity with a constant velocity drive motor driving a document sheet feeding roller overlying said imaging platen for feeding engagement of document sheets between said constant velocity driven document sheet feeding roller and said platen when a forward driving signal is applied to said constant velocity drive motor, said document handler providing a document sheet feeding path from a document input to said imaging platen and to a document output, the improvement comprising:

a document feeding control system which predicts when said constant velocity driven sheet feeding roller will be driven against said imaging platen with no document sheet therebetween; and

an automatic lifting system which automatically lifts said constant velocity document sheet feeding roller away from said imaging platen in response to said document feeding control system predicting that no document sheet will be between said constant velocity driven sheet feeding roller and said platen and said forward driving signal is being applied to said constant velocity drive motor;

wherein said constant velocity document sheet feeding roller has at least four sections of two different diameters, comprising an inner pair of common diameter feed roller surfaces, and an outer pair of slightly smaller diameter surfaces on opposite axial sides of said inner pair of feed roller surfaces which are not feeding roller surfaces.

5,488,465

ELECTROPHOTOGRAPHIC DEVELOPING METHOD USING MAGNETIC DEVELOPING MATERIAL AND APPARATUS EMPLOYED THEREFOR

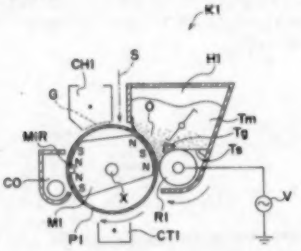
Hajime Yamamoto, Ibaraki, and Hiroshi Terada, Ikoma, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 27, 1992, Ser. No. 919,905

Claims priority, application Japan, Jul. 26, 1991, 3-187272; Sep. 17, 1991, 3-236061; Dec. 27, 1991, 3-345990; Dec. 27, 1991, 3-346128; Dec. 27, 1991, 3-346132; Feb. 4, 1992, 4-018616

Int. Cl.[6] G03G *13/00*

U.S. Cl. 355—246 **4 Claims**



1. An electrophotographic apparatus which comprises:

a movable electrostatic latent image holding member enclosing a fixed magnet means therein,

a charger means for charging said latent image holding member;

a latent image forming means for forming an electrostatic latent image on said latent image holding member,

a developing material hopper confronting a surface of said latent image holding member and containing a magnetic developing material therein so as to cause the developing material to be magnetically attracted and adhere onto the surface of said latent image holding member by an action of said fixed magnet means, and

all electrode roller provided through a gap with respect to the surface of said electrostatic latent image holding member, charging width of said latent image holding member by said charger means being larger than magnetizing width of said fixed magnet means.

5,488,466

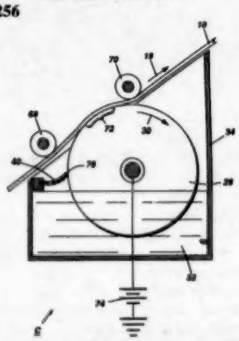
LIQUID DEVELOPMENT SYSTEM

Christian O. Abreu, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 8, 1994, Ser. No. 287,556

Int. Cl.[6] G03G *15/10*

U.S. Cl. 355—256 **11 Claims**



1. An apparatus for developing a latent image recorded on a flexible member with a liquid developer material, including: a housing defining a chamber having an open end for storing a supply of the liquid developer material therein; and

a donor roll having an exterior circumferential surface, said donor roll being at lease partially immersed in the liquid developer material being stored in the chamber of said housing and advancing the liquid developer material to the latent image through the open end of the chamber of said housing, with the flexible member having a portion thereof wrapped about a portion of the exterior circumferential surface of said donor roll so as to form an extended development zone; and

means for adjusting the liquid developer material on said donor roll to a thickness ranging from about 3 microns to about 10 microns.

5,488,467

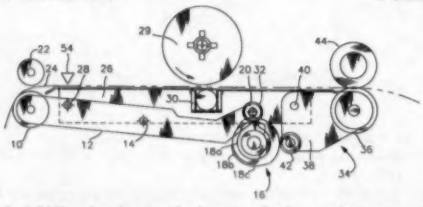
LASER PRINTER PAPER HANDLING SYSTEM

Faustin T. Marentes, Montebello, and Jorge Monasterio, Lake Forest, both of Calif., assignors to RJS, Inc., Monrovia, Calif.

Filed Jun. 24, 1994, Ser. No. 265,232

Int. Cl.[6] G03G *15/20*

U.S. Cl. 355—282 **4 Claims**



1. A bidirectional paper feed system for laser printers comprising:

a registration roller movable from a first position engaging a print media for frictional drive and a second position releasing said media;

means for selectively engaging the print media intermediate a photoconductive drum and a transfer unit, said engaging means movable from a first position to a second position;

a fuser roller positionable in a first position separated from said print media and a second position engaging said print media for frictional transport of the media;

first means for controllably positioning said registration roller between said first and second position;

second means for controllably positioning said engagement means between said first and second position;

third means for controllably positioning said fuser roller between said first and second positions;

reversible drive means separably connected to drive said registration roller and said fuser roller and responsive to a drive signal; and

a controller for controlling said first, second and third positioning means, said controller executing a first state wherein the registration roller is in said first position, said engagement means is in said first position and said fuser roller is in said first position, a second state wherein said registration roller is in said first position, said engagement means is in said second position and said fuser roller is in said first position and a third state wherein said registration roller is in said second position, said engagement means is in said second position and said fuser roller is in said second position, said controller further selectively issuing a forward drive signal in said first, second and third state and selectively issuing a reverse drive signal in said first state.

5,488,468

OPTICAL DISTANCE MEASURING APPARATUS HAVING SEMICONDUCTOR POSITION SENSITIVE PHOTODETECTOR

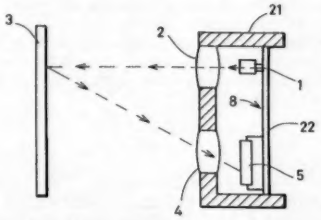
Shinya Kawanishi, Tenri; Kouichi Furuta, Nara, and Keiichi Okada, Yamatokouriyama, all of, Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Dec. 22, 1992, Ser. No. 994,970

Claims priority, application Japan, Dec. 26, 1991, 3-344892; Jan. 7, 1992, 4-000087 U; Mar. 24, 1992, 4-065754; May 6, 1992, 4-113489

Int. Cl.[6] G01C *3/08*

U.S. Cl. 356—4.01 **20 Claims**



1. A distance measuring apparatus, comprising:

a light, emitting element;

a light receiving element;

a wiring board having a signal processing circuit formed thereon detecting a signal current from said light receiving element; and

a housing case including a conductive material, accommodating at least said light receiving element, for directing light from said light emitting element to an object to be detected, receiving light reflected by the object at said light receiving element and measuring a distance to the object based on the signal current, wherein said housing case electrically shields at least said light receiving element from noise.

5,488,469

CELL ANALYZING APPARATUS

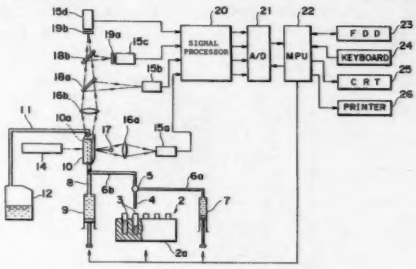
Koji Yamamoto; Masahiro Hanafusa, both of Kyoto; Fumio Onuma, Kameoka, and Michio Nishimura, Osaka, all of, Japan, assignors to Omron Corporation, Kyoto, Japan

Filed Aug. 28, 1992, Ser. No. 936,680

Claims priority, application Japan, Aug. 30, 1991, 3-219737; Sep. 2, 1991, 3-221390; May 14, 1992, 4-121787

Int. Cl.[6] G01N *21/00*

U.S. Cl. 356—72 **10 Claims**



1. A cell analyzing apparatus comprising:

a flow cell through which a specimen flows;

a light source for irradiating cells in the specimen flowing through said flow cell;

cell light-information detecting means for detecting cell light information as detected cell light information, said detected cell light information comprising at least one parameter for each cell irradiated with the light source;

cell light-information selecting means for selecting, as selected cell light information, cell light information from the detected cell light information;

cell light-information processing means for processing the detected cell light information and the selected cell light information;

control specimen concentration information measuring means for measuring a control cell count of a control specimen having a known concentration;

subject specimen information measuring means for measuring a subject cell count of a subject specimen; and

subject specimen concentration correcting means for correcting the subject cell count, based upon the control cell count, to obtain the concentration of the subject specimen,

output means for outputting results of at least one of processing by said cell-light information processing means, measuring by said control specimen concentration information measuring means, measuring by said subject specimen information measuring means, and correcting by said subject specimen concentration means;

wherein said subject specimen concentration correcting means obtains a concentration of the subject specimen, using information indicative of measurement time obtained by said control specimen concentration information measuring means, based upon a cell count of the subject specimen obtained over a measurement time identical to the measurement time obtained by said control specimen concentration information measuring means according to the formula $C=C_o\times(N/N_o)$;

wherein C represents the concentration of the subject specimen, C_o represents the concentration of the control specimen, N represents the cell count of the subject specimen and N_o represents the cell count of the control specimen.

5,488,470

BENDING ANGLE DETECTOR FOR USE IN A BENDING MACHINE

Toshiyuki Ooenoki, Hirakata, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

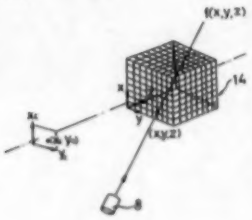
PCT No. PCT/JP93/01538, § 371 Date Jun. 29, 1994, § 102(e) Date Jun. 29, 1994, PCT Pub. No. WO94/11701, PCT Pub. Date May 26, 1994

PCT Filed Oct. 25, 1993, Ser. No. 256,083

Claims priority, application Japan, Nov. 10, 1992, 4-300112

Int. Cl.[6] G01B *11/26;* **G01C** *1/00;* **G06F** *15/46;* **B21C** *51/00*

U.S. Cl. 356—138 **6 Claims**



1. A bending angle detector for use in a bending machine in which a sheet-like workpiece is bent at a specified angle by means of an upper bender and a lower bender, the detector comprising:

(a) projector means for projecting spot lights onto an object to be photographed forming bright points on a surface of the object;

(b) photographing means for photographing the object to be photographed on the surface of which bright points are formed by the projector means;

(c) coordinate transformation parameter calculating means a) for forming a virtual cubic lattice in space by moving, at a specified pitch, a lattice pattern which is formed by arranging a number of reference positions in the lattice pattern of a cubic lattice on the surface of the object to be photographed, and b) for calculating a coordinate transformation parameter from a plurality of images obtained by photographing each point of the cubic lattice, the coordinate transformation parameter being used for transformation between a space coordinate system in which each axis of the cubic lattice is set as a reference axis and a plane coordinate system which represents an image plane of the photographing means;

(d) linear equation calculating means for calculating a linear equation representing, in the space coordinate system, each spot light projected by the projector means from positions of at least two bright points formed in the lattice patterns of the cubic lattice;

(e) coordinate value transforming means a) for photographing a bent workpiece on outer faces of which at least three bright points are formed by projecting at least three spot lights thereon by means of the projector means and b) for transforming coordinate values of each photographed bright point in the plane coordinate system to those of the space coordinate system by the use of the coordinate transformation parameter calculating means and the linear equation calculating means; and

(f) bending angle calculating means for calculating a planar equation representing the three bright points from the coordinate values of the at least three bright points which have been transformed to the space coordinate system by the coordinate value transforming means, herein containing an angle at which the workpiece is bent.

5,488,471

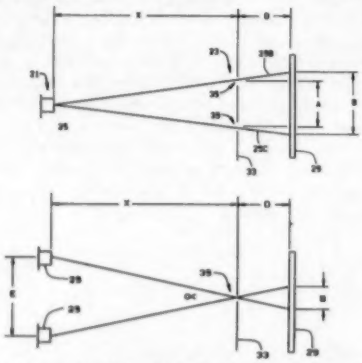
SENSORS FOR VEHICLE ALIGNMENT SYSTEM AND APPARATUS USING SAME

James W. McClenahan, 1015 Arcaro Ct., Florissant, Mo. 63034; Leigh R. Burns, Jr., 104 Kenneth, Troy, Ill. 62294; Michael T. Stieff, 20 Hill Trail Ct., Wentzville, Mo. 63385, and Daniel B. January, 737 Hidden Lake Dr., St. Peters, Mo. 63376

Filed Dec. 2, 1993, Ser. No. 162,452

Int. Cl.[6] G01B *11/26;5/24;* **G01C** *3/00;3/08*

U.S. Cl. 356—139.09 **24 Claims**



1. An improved vehicle wheel alignment system comprising:

a first sensor unit adapted to be removably mounted to a front wheel of a vehicle whose alignment is to be tested;

a second sensor unit adapted to be removably mounted to a rear wheel of the vehicle under test such that the front wheel and the rear wheel are disposed on the same side of the vehicle;

said first and second sensor units obtaining wheel alignment data for their respective wheels;

determining means for determining wheel alignment characteristics of said front and rear wheels from the wheel alignment data from the first and second sensor units;

at least one of the first and second sensor units having an active pixel array detector, said active pixel array detector providing the wheel alignment data for said sensor unit;

said first and second sensor units including means, including at least one radiation source, for projecting at least two spatially separated images upon the active pixel array detector, the spatial separation of said two images being a function of the wheelbase of the vehicle under test;

said determining means being responsive to the active pixel array detector to determine the wheelbase of the vehicle under test from the spatial separation of the images on the active pixel array detector.

5,488,472

APPARATUS FOR DETERMINING VEHICLE WHEEL ALIGNMENT POSITIONS AND ORIENTATIONS

Daniel B. January, St. Charles County, Mo., assignor to Hunter Engineering Company, Bridgeton, Mo.

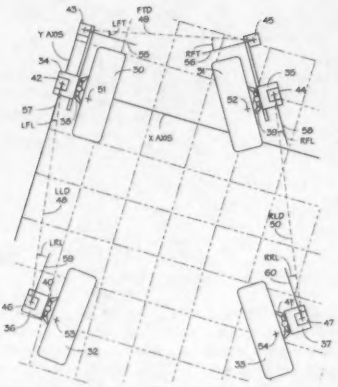
Filed Jan. 10, 1995, Ser. No. 371,007

Int. Cl.[6] G01B *11/26;5/255*

U.S. Cl. 356—139.09 **32 Claims**

1. A wheel alignment apparatus for determining the alignment positions and orientations of vehicle wheels in relation to an arbitrary coordinate system comprising:

at least one pair of measurement transducers, each transducer being mounted on a separate vehicle wheel in a known geometrical relationship to its corresponding wheel, at least one transducer of the pair being capable of measuring a relative bearing to the other transducer of the pair, and at least one transducer of the pair being capable of measuring a range to the other transducer of the pair;



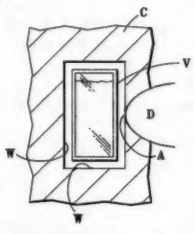
a computer being operatively connected to each transducer, said computer being responsive to the measured range and relative bearing to determine the coordinates of the wheels on which the transducers are mounted in an arbitrary coordinate system, said computer being further responsive to transform said coordinates to corresponding coordinates in a desired reference frame, so as to provide measurements of actual wheel positions and orientations in said desired reference frame.

5,488,473

METHOD OF AND APPARATUS FOR INCREASING MEASUREMENT SENSITIVITY OF FLUORESCENCE AND LUMINESCENCE

Arthur W. Springsteen, New London, N.H., and Jeffrey L. Taylor, Mt. Airy, Md., assignors to Labsphere, Inc., N. Sutton, N.H.

Filed Mar. 1, 1994, Ser. No. 204,830
Int. Cl.[6] G01N *21/64;21/76*
U.S. Cl. 356—317 **4 Claims**



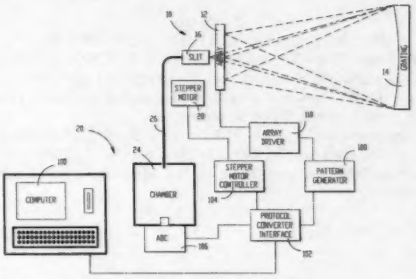
1. A method of increasing the sensitivity of measurement of fluorescing and/or luminescing light emitted from a volume, that comprises, enclosing the emission volume in a relatively closely fitting cavity enclosure; providing all of the inner walls of the cavity enclosing the volume with a highly reflecting diffuse material to enable all the light emitted from the emission volume inside the cavity to contribute to the radiance of the cavity inner walls, and the multiple reflections therefrom to increase the wall radiance; and positioning a detector to maximize its view of the radiant walls.

5,488,474

HADAMARD PHASING IN A MULTISOURCE ARRAY

William G. Fateley, and Radoslaw Sobczynski, both of Manhattan, Kans., assignors to D.O.M. Associates Int'l., Manhattan, Kans.

Filed May 6, 1994, Ser. No. 238,916
Int. Cl.[6] G01J *3/28*
U.S. Cl. 356—326 **33 Claims**



1. A spectrophotometer apparatus comprising:

an electromagnetic radiation source array having a plurality of activatable radiation source elements configured for activation in a plurality of encodement patterns;

means for detecting radiation emitted from said elements, and for producing signals representative thereof;

structure defining an optical pathway for directing radiation from said array to said detecting means; and

control means including

activating means coupled with said array for selectively activating said elements in a plurality of sequential encodement patterns, and

means coupled with said detecting means for receiving and processing said signals for producing an analysis thereof,

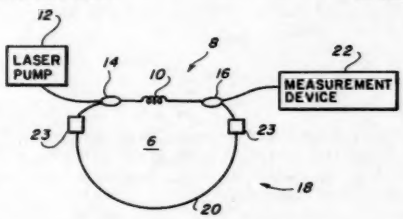
said activating means including generating means for generating a plurality of periodic activating signals having respective phases in order to thereby activate said elements, and phasing means for selectively adjusting the relative phases of said periodic activating signals in accordance with a predetermined pattern.

5,488,475

ACTIVE FIBER CAVITY STRAIN SENSOR WITH TEMPERATURE INDEPENDENCE

Edward J. Friebele, Cheverley, Md., and Alan D. Kersey, Fairfax Station, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 31, 1994, Ser. No. 220,855
Int. Cl.[6] G01B *9/02*
U.S. Cl. 356—352 **13 Claims**



1. A strain sensor, comprising:

a laser pump;

an active doped fiber gain section coupled to and pumped to a lasing state by the said pump; and

a measurement device coupled to said gain section and measuring strain responsive to an oscillation frequency of light exiting from said gain section;

wherein said measurement device comprises a beat frequency measurement device measuring a beat frequency of two oscillation modes of said section.

5,488,476

APPARATUS AND METHOD USING OPTICAL DIFFRACTION TO MEASURE SURFACE ROUGHNESS

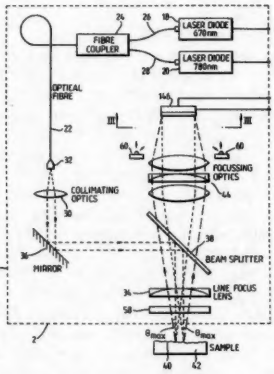
Daniel Mansfield; Ian Bell; Ian Buehring, and Jennifer Harding, all of Leicester, Great Britain, assignors to Rank Taylor Hobson Limited, Great Britain

Continuation of Ser. No. 777,349, Dec. 5, 1991, abandoned. This application Oct. 12, 1994, Ser. No. 322,088

Claims priority, application United Kingdom, Apr. 12, 1990, 9008331

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—354 **66 Claims**



1. Apparatus for measuring surface roughness of a workpiece comprising:

a) means for illuminating the workpiece to produce a diffraction pattern;

b) means for determining a set of values dependent upon the energy distribution in said pattern;

c) means for providing, for each of a plurality of values of surface roughness, a set of interpolated reference values representing the energy distribution in a diffraction pattern, said set of reference values being obtained by interpolation between first and second sets of reference values representing the energy distributions in diffraction patterns obtained respectively from relatively symmetrical and relatively asymmetrical surfaces; and

d) means for comparing the set of values determined from said diffraction pattern produced by the workpiece with said set of interpolated reference values to obtain an indication of said surface roughness.

5,488,477

METHODS AND APPARATUS FOR PROFILING SURFACES OF TRANSPARENT OBJECTS

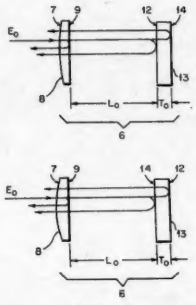
Peter de Groot, Middletown, Conn., assignor to Zygo Corporation, Middlefield, Conn.

Filed Nov. 15, 1993, Ser. No. 153,146

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—359 **31 Claims**

1. A method of measuring the surface topography of each of opposed front and rear surfaces of a substantially transparent



object without first treating at least one of the surfaces to reduce reflections from the at least one surface, comprising the steps of:

(a) positioning the object in a first orientation defining a first measurement geometry;

(b) directing an optically-coherent illumination beam of a first wavelength onto the front surface of the object positioned in said first orientation so as to reflect the illumination beam from the front surface and generate, using phase shifting interferometry, a first phase map of the object formed by a mixture of reflections of the illumination beam from the front surface and of reflections from the rear surface of at least a portion of the illumination beam that has passed through the substantially transparent object and been reflected back through the object from the rear surface;

(c) after generating said first phase map, performing a measurement-geometry modification from said first to a second measurement geometry by changing said first orientation of the object to a second orientation of the object;

(d) generating, using phase shifting interferometry, a second phase map of the object by illuminating the object in said second measurement geometry, said second phase map being formed by a mixture of reflections from the first and second surfaces of the object; and

(e) calculating the surface topography of each of said front and rear surfaces of the object from said first and second phase maps.

5,488,478

METHOD AND APPARATUS FOR MEASURING THE SHAPE OF A SURFACE OF AN OBJECT

John D. Bullock, High Close, Wales, and Norman W. Williams, Neath, Great Britain, assignors to British Steel PLC, London, Great Britain

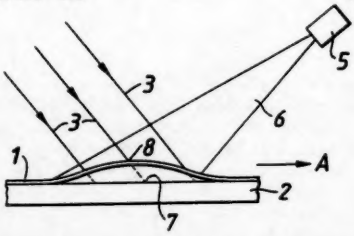
PCT No. PCT/GB93/00309, § 371 Date Oct. 3, 1994, § 102(e) Date Oct. 3, 1994, PCT Pub. No. WO93/16353, PCT Pub. Date Aug. 19, 1993

PCT Filed Feb. 15, 1993, Ser. No. 290,811

Claims priority, application United Kingdom, Feb. 18, 1992, 9203448

Int. Cl.[6] G01B *11/30;11/24*

U.S. Cl. 356—376 **6 Claims**



1. Apparatus for measuring the shape of a surface of an object, the apparatus comprising:

laser means operable to direct onto a surface of an object moving relative to the laser means a plurality of light beams spaced one from another in the direction of movement of the object to produce on the object surface a plurality of light patterns which extend across the object in a direction generally normal to the direction of movement of the object;

scanning means for scanning the laser-generated light beams continuously across the object surface in a direction generally normal to the direction of movement of the object; and

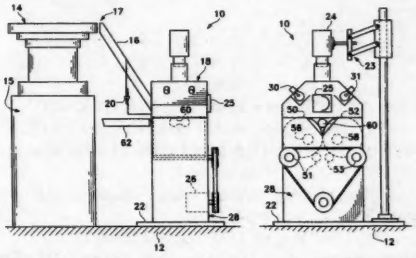
an array of line-scan cameras positioned to view and record the said light patterns and to process in parallel data representative of the recorded light patterns to provide a measure of the shape of the object surface.

5,488,479

MACHINE VISION SYSTEM FOR INSPECTION OF AGRICULTURAL COMMODITIES

Earl J. Williams, Tifton, Ga., and Stephen D. Adams, Auburn, Ala., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Dec. 17, 1992, Ser. No. 991,815
Int. Cl.[6] G01J *3/46*
U.S. Cl. 356—402 **10 Claims**



1. A machine vision system to inspect an agricultural commodity comprising:

a support housing;

a pair of rollers mounted in said housing, at least one of said pair of rollers being rotatable, said pair of rollers are parallel to each other and translucent in order to provide a back light to remove shadows on said agricultural commodity during inspection and recordation of views of said agricultural commodity;

a first opening in said housing for receiving said commodity therethrough;

motor means connected to said pair of rollers for rotating at least one roller of said pair of rollers; and

a single camera secured to said support housing so as to be substantially, vertically positioned above and adjacent to said pair of rollers, said agricultural commodity supported by and positioned between said pair of rollers, said camera actuated to inspect and record views of said agricultural commodity and thereby determine maturity of said agricultural commodity.

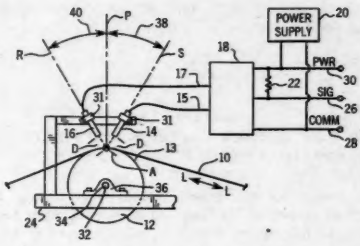
5,488,480

APPARATUS AND METHOD FOR DETECTING A HEAT SEAL IN A MOVING PLASTIC FILM

Stephen A. Saindon; Kevin O. Heindel, both of Appleton, and James G. Morrow, Wauwatosa, all of Wis., assignors to CMD Corporation, Appleton, Wis.

Filed Feb. 16, 1994, Ser. No. 197,216
Int. Cl.[6] G01N *21/84;21/00*
U.S. Cl. 356—429 **18 Claims**

8. An arrangement for detecting a heat seal in a plastic film moving in a predetermined direction of travel comprising:



a support surface disposed to support the moving plastic film at an interface between the surface and the film;

a first light guide positioned to direct light toward the interface along a line substantially parallel to the heat seal in the film and substantially perpendicular to the direction of travel, a portion of the light being reflected by the film at varying intensity;

a second light guide positioned to receive the portion of the light reflected by the film along the line; and

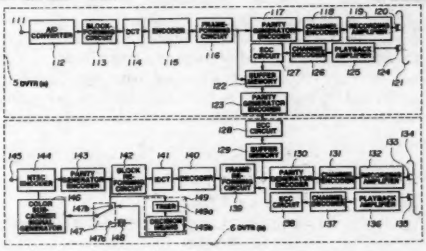
an interface circuit coupled to the first and second light guides, the interface circuit producing a signal representative of the intensity of the light reflected by the film, the interface circuit being adjustable for selectively detecting the heat seal in the film oriented substantially perpendicular to the path of travel based upon changes in the signal.

5,488,481

APPARATUS FOR GENERATING A COMPOSITE VIDEO SIGNAL

Hiroshi Okada, Kanagawa, and Hisato Shima, Chiba, both of, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 13, 1993, Ser. No. 165,419
Claims priority, application Japan, Dec. 14, 1992, 4-333141
Int. Cl.[6] H04N *9/80*
U.S. Cl. 358—319 **5 Claims**



1. A digital recording/reproducing apparatus having an external inputting digital interface, said apparatus comprising:

an encoder for generating composite video signals from digital video signals,

a color sub-carrier signal generator for generating color sub-carrier signals to be supplied to said encoder on the basis of horizontal synchronizing signals,

a changeover switch for changing over the horizontal synchronizing signals to be supplied to said color sub-carrier signal generator,

a horizontal synchronizing signal oscillator for generating standard horizontal synchronizing signals, and

a changeover control circuit for controlling the changeover of said changeover switch,

said changeover switch being controlled by said changeover control circuit for selecting the standard horizontal synchronizing signals generated by said horizontal synchronizing signal oscillator for an external input mode when the digital video signals are entered from outside via said digital interface, said changeover switch being also controlled by said

changeover control circuit for selecting horizontal synchronizing signals derived from playback video signals obtained during a playback mode.

5,488,482

HIGH-EFFICIENCY ENCODER AND VIDEO INFORMATION RECORDING/REPRODUCING APPARATUS

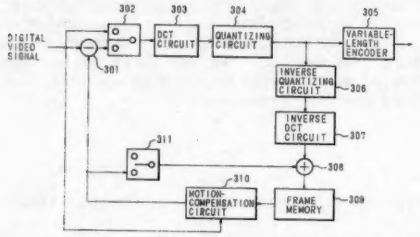
Tomohiro Ueda; Takashi Iotow; Yoshinori Asamura; Ken Onishi, and Hidetoshi Mishima, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 11,243, Jan. 29, 1993. This application Mar. 12, 1993, Ser. No. 30,538

Claims priority, application Japan, Jan. 29, 1992, 4-013719; Feb. 25, 1992, 4-037599; Feb. 25, 1992, 4-037821; Feb. 28, 1992, 4-043075; Sep. 4, 1992, 4-236909; European Pat. Off., Jan. 28, 1993, 93300616

Int. Cl.[6] H04N *5/917*

U.S. Cl. 358—339 **12 Claims**



1. A video information recording and reproducing apparatus, comprising:

intra mode encoding means for encoding a first portion of an input video signal and for storing the first portion of the input video signal decoded, as a reference image;

predictive mode encoding means for determining and subsequently encoding a difference based upon a second portion of the input video signal and the reference image; and

selection means for selecting one of the intra mode encoding means and the predictive mode encoding means for encoding the second portion of the input video signal.

5,488,483

FACSIMILE WITH USER SELECTIVE COMPRESSION METHODS

Masahiro Murayama, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 93,630, Jul. 20, 1993. This application Sep. 27, 1994, Ser. No. 313,396

Claims priority, application Japan, Jul. 20, 1992, 4-192116; Jul. 20, 1992, 4-192117

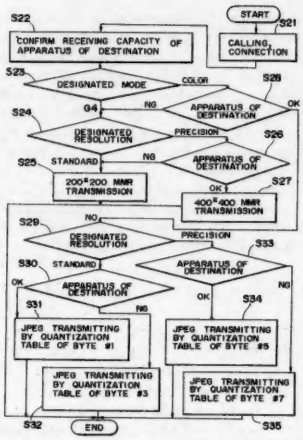
Int. Cl.[6] H04N *1/46;1/41;7/01*

U.S. Cl. 358—426 **32 Claims**

27. An image processing apparatus comprising:

encoding means having a first encoding method including a converting process for converting image information into frequency space and a quantization process for quantizing the converted image information, said quantization process capable of changing a quantization characteristic in encoding image information, and a second encoding method having an encoding characteristic different from that of said first encoding method;

encoding selection means for selecting either said first encoding method or second encoding method; and



setting means for setting the quantization characteristic in said first encoding method by selecting one of a plurality of quantization tables.

5,488,484

IMAGE DATA PROCESSING APPARATUS WITH ADJUSTMENT OF IMAGE PORTION PASTE-IN POSITION TO MINIMIZE AMOUNT OF COMPRESSED IMAGE DATA

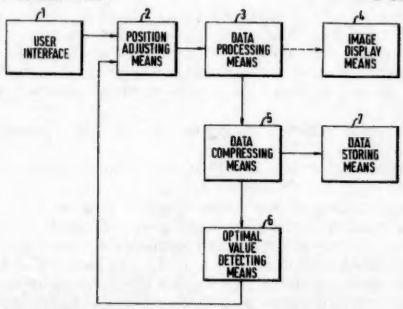
Yuichi Miyano, Kanagawaken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 14, 1994, Ser. No. 260,630

Claims priority, application Japan, Jun. 15, 1993, 5-142429

Int. Cl.[6] H04N *1/387;1/40;1/415*

U.S. Cl. 358—433 **1 Claim**



1. An image data processing apparatus, comprising:

position adjusting means for adjusting an initial paste-in position in pasting a secondary image in a primary image;

image data editing means for editing a third image resulting from pasting the secondary image in the primary image;

image data compressing means for compressing image data of said third image through block encoding:

optimal value detecting means for detecting an optimal value of the compressed image data by absolutely or relatively determining an amount of the compressed data produced by the image data compressing means; and

means for automatically adjusting a paste-in position within a given space around the initial paste-in position so as that the amount of the compressed data becomes a minimum.

5,488,485
IMAGE READING APPARATUS

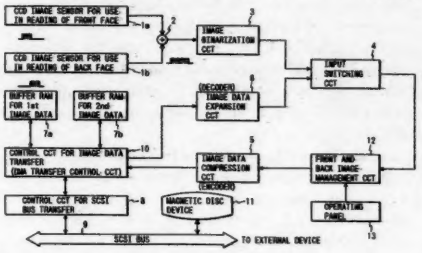
Masami Amemiya, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 45,298, Apr. 12, 1993, abandoned, which is a division of Ser. No. 766,020, Sep. 26, 1991, Pat. No. 5,392,135. This application Apr. 3, 1995, Ser. No. 423,875

Claims priority, application Japan, Jan. 5, 1990, 2-266455; Mar. 29, 1991, 3-66752

Int. Cl.[6] H04N *1/40;1/04;* **G03B** *27/32*

U.S. Cl. 358—444 **9 Claims**


CCD IMAGE SENSOR FOR USE IN READING OF FRONT FACE
CCD IMAGE SENSOR FOR USE IN READING OF BACK FACE
IMAGE BINARIZATION CCT
INPUT SWITCHING CCT
BUFFER RAM FOR 1st IMAGE DATA
BUFFER RAM FOR 2nd IMAGE DATA
(DECODER) IMAGE DATA EXPANSION CCT
CONTROL CCT FOR IMAGE DATA TRANSFER (DMA TRANSFER CONTROL CCT)
IMAGE DATA COMPRESSION CCT (ENCODER)
FRONT AND BACK IMAGE MANAGEMENT CCT
CONTROL CCT FOR SCSI BUS TRANSFER
MAGNETIC DISC DEVICE
OPERATING PANEL
SCSI BUS
TO EXTERNAL DEVICE

1. An image processing apparatus comprising:

first input means for inputting first image data representing an image on a front face of an original line by line;

second input means for inputting second image data representing an image on a back face of the original line by line;

mixing means for mixing the first image data and the second image data line by line and for outputting mixed image data line by line;

instruction means for instructing one of the front and back faces of the original;

selection means for selecting one of the first and second image data among the mixed image data output from said mixing means line by line in accordance with the instruction by said instruction means;

temporary memory means for temporarily storing the mixed image data output from said mixing means;

compression means for compressing the mixed image data output from said mixing means, wherein said temporary memory means stores the mixed image data compressed by said compression means; and

expansion means for expanding the compressed mixed image data read out from said temporary memory means, wherein said selection means selects one of the first and second image data among the mixed image data expanded by said expansion means.

5,488,486
IMAGE PROCESSING SYSTEM

Hiromasa Shimizu, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 846,012, Mar. 4, 1992. This application Jan. 31, 1994, Ser. No. 189,245

Claims priority, application Japan, Mar. 11, 1991, 3-044850

Int. Cl.[6] H04N *1/393;1/41*

U.S. Cl. 358—451 **14 Claims**

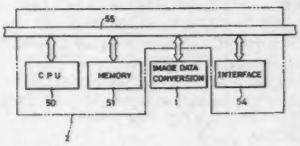
1. An image processing system for processing an image represented by run-lengths, said system comprising:

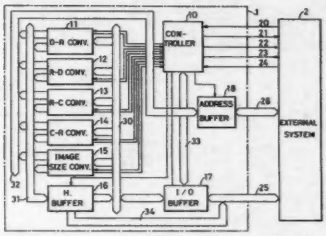
A) converting means including:

1) first means for, when a run-length is less than a base number which is an n-th power of "2" where n is an integer, representing the run-length by run-length data using a predetermined formula; and

2) second means for, when a run-length is equal to or greater than the base number, using the predetermined formula for representing the run-length by run-length data constituting:

a) a first part corresponding to a multiple of the base number; and





b) a second part corresponding to a value less than the base number; and

B) processing means, connected to the converting means, for processing the first and second parts of the run-length data obtained by said first means or said second means in order to code the data.

5,488,487
IMAGE FORMING APPARATUS, AND MODULATING METHOD THEREIN

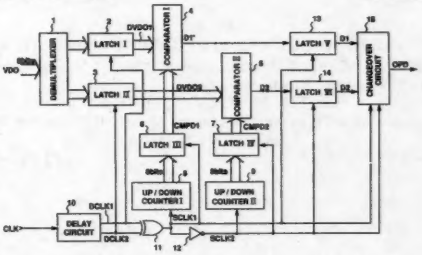
Masaki Ojima; Masaharu Ohkubo, both of Yokohama; Michio Itoh, Hachiohji; Hiroshi Sasame; Hiromichi Yamada, both of Yokohama; Tetsuo Saito, Tokyo; Atsushi Kashihara, Hachiohji; Takashi Kawana, Yokohama; Hiroshi Mano, Tokyo; Kaoru Seto, Chigasaki, and Hiroshi Atobe, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 590,700, Oct. 1, 1990, abandoned. This application Aug. 17, 1993, Ser. No. 107,037

Claims priority, application Japan, Jan. 2, 1989, 1-255294; Jan. 17, 1989, 1-268227; Nov. 23, 1989, 1-299732

Int. Cl.[6] H04N *1/23;* **H03K** *5/135;5/14*

U.S. Cl. 358—456 **14 Claims**



1. An image signal modulating device in a recording apparatus which forms an output image based upon a multivalued input recording signal, comprising:

clock generating means for generating a clock signal;

converting means for converting the multivalued input recording signal into a plurality of corresponding binary image signals; and

output means for outputting the plurality of binary image signals from said converting means in response to the clock signal from said clock generating means,

wherein said output means is outputting the plurality of binary image signals of different phase.

5,488,488

FACSIMILE MACHINE HAVING RECEIVED-IMAGE DISPLAY FUNCTION

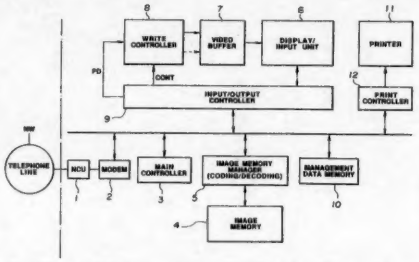
Nobukazu Shimizu, Hino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 13, 1992, Ser. No. 882,123

Claims priority, application Japan, May 14, 1991, 3-136981

Int. Cl.[6] H04N *1/00*

U.S. Cl. 358—468 **11 Claims**



1. A facsimile macing having a received-image display function, comprising:

an image memory for storing therein one case or a plurality of cases of image data received form another facsimile machine together with management data indicative of different files and pages;

a video buffer for temporarily storing therein part of the image data stored in the image memory corresponding to one page specified based on the management data as a bit image data;

display means for visually displaying thereon the image data temporarily stored in the video buffer as its storage image;

video buffer write control means for controlling writing operation of the image data specified to be temporarily stored in the video buffer to the video buffer; and

input means for inputting a rotational display instruction with respect to an image to be visually displayed on the display means,

wherein the video buffer write control means writes the specified one-page image data into the video buffer and when the rotational display instruction is input through the input means, exchanges writing positions of pixels of the specified one-page image data to the video buffer in a predetermined manner to rotate the display of the image.

5,488,489

IMAGE READ-OUT AND REPRODUCING APPARATUS

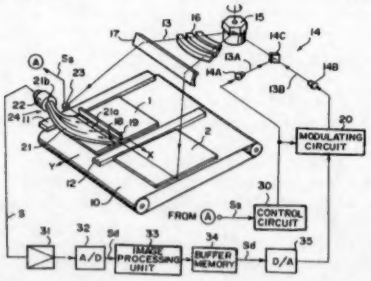
Ichirou Miyagawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 19, 1992, Ser. No. 836,838

Claims priority, application Japan, Mar. 1, 1991, 3-036097

Int. Cl.[6] H04N *1/04*

U.S. Cl. 358—474 **12 Claims**



1. An image read-out and reproducing apparatus which comprises:

i) a sub-scanning means for supporting an image storage sheet, on which image information has been recorded, and a recording material, on which an image is to be reproduced during its exposure to a light beam, such that said image storage sheet and said recording material stand side by side with each other and in the same plane, said sub-scanning means conveying said image storage sheet and said recording material in the same direction or in directions opposite to each other,

ii) a light source for producing a light beam,

iii) a single main scanning means for causing said light beam, which has been produced by said light source, to scan said image storage sheet and said recording material in a direction, which is approximately normal to the direction or directions along which said image storage sheet and said recording material are conveyed, and with a scanning width that extends across both said image storage sheet and said recording material in a single scan,

iv) a photoelectric detection means for detecting light, which is radiated out of a portion of said image storage sheet exposed to said light beam, an image signal representing the image information, which has been recorded on said image storage sheet, being thereby obtained, and

v) a light modulating means for modulating said light beam in accordance with a predetermined image signal while said light beam is scanning said recording material.

5,488,490

IMAGE READING APPARATUS FOR READING IMAGES RECORDED ON FILM

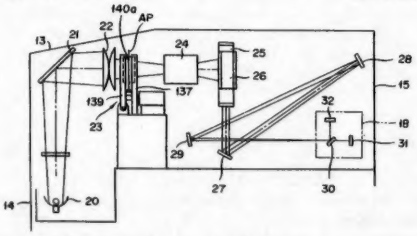
Kenji Sawada, Machida; Yashushi Yamade, Sagamihara, and Sei Onuma, Tokyo, all of, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 25, 1992, Ser. No. 857,315

Claims priority, application Japan, Mar. 26, 1991, 3-061424; Mar. 26, 1991, 3-061426; Aug. 27, 1991, 3-215405

Int. Cl.[6] H04N *1/04*

U.S. Cl. 358—487 **18 Claims**



1. An image reading apparatus, comprising:

image projecting means for projecting a beam of light containing image information of a prescribed line from an original;

a separating member for separating said beam of light projected by said image projecting means into a first direction and a second direction;

a first image reading member for reading out a portion of said prescribed line contained in the beam of light separated into said first direction by said separating member;

a second image reading member disposed at an equivalent position to said first image reading member relative to said separating member and adapted to read out a portion of said prescribed line contained in the beam of light separated into said second direction by said separating member; and

supporting means for integrally supporting said separating member, said first image reading member, and said second image reading member as one unit.

5,488,491

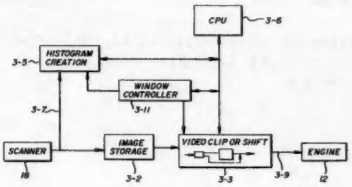
IMAGE PROCESSING APPARATUS AND METHOD FOR ELIMINATING BACKGROUND DENSITY IN A DESIGNATED IMAGE AREA

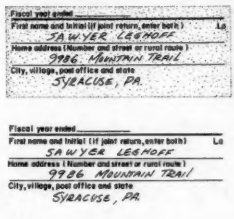
James J. Steinkirchner, Brockport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 6, 1993, Ser. No. 86,391

Int. Cl.[6] H04N *1/38*

U.S. Cl. 358—501 **24 Claims**




Fiscal year ended
First name and initial (if joint return, enter both)
SAWYER LEGHOFF
Home address (Number and street or rural route)
9986 MOUNTAIN TRAIL
City, village, post office and state
SYRACUSE, PA.
Fiscal year ended
First name and initial (if joint return, enter both)
SAWYER LEGHOFF
Home address (Number and street or rural route)
9986 MOUNTAIN TRAIL
City, village, post office and state
SYRACUSE, PA

8. An image processing apparatus comprising:

scanning means for scanning and outputting first signals representing image data as determined by sensing intensity variations in an original image;

area designating means for generating second signals representing information relative to a determined image area of the document containing both foreground and background density;

area operation means responsive to the first and second signals for operating on the image data in the area to define third signals representing parameters for substantially eliminating the background density while substantially preserving information with foreground density; and

memory means for storing said third signals;

and wherein the area operation means includes;

means for generating a histogram of pixel densities and their frequencies for pixels residing within the determined image area;

means for subjecting data in said histogram to a low pass filter and outputting filtered data;

means for determining a slope of points in said filtered data;

means for defining a geometric minimum within a predetermined amount of a statistical average of the histogram data;

means for determining geometric maximums on each side of the geometric minimum; and

means for comparing a maximum on one side with a maximum on the other side and defining said parameters if one particular maximum is greater than the other.

5,488,492

APPARATUS FOR ADJUSTING COLOR TONE OF IMAGE TO BE RECORDED

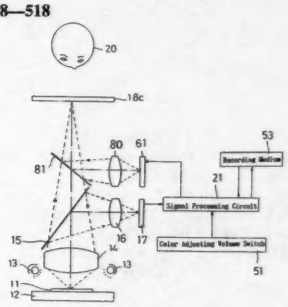
Tetsuya Abe, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 3, 1994, Ser. No. 253,695

Claims priority, application Japan, Jun. 4, 1993, 5-134852; Jun. 4, 1993, 5-134853

Int. Cl.[6] H04N *1/60*

U.S. Cl. 358—518 **35 Claims**



1. A color adjusting apparatus that includes color image pickup means for picking-up an object image signal of an object and color adjusting means for adjusting a color component of said object image signal picked-up by the color image pickup means, said color adjusting apparatus comprising:

an optical system for converging light that is one of reflected from or transmitted through the object, to form a direct image of the object;

light splitting means for splitting object light;

a screen located at a point of convergence of a bundle of rays of light split by said light splitting means;

said color image pickup means being located at a point of convergence of another bundle of rays of light split by said light splitting means;

signal inverting means for inverting object image signals picked-up by said color image pickup means; and

inverted image projecting means for projecting an inverted image, corresponding to said object image signals inverted by said signal inverting means and adjusted by said color adjusting means, to superimpose said inverted image on said direct image.

5,488,493

HOLOGRAPHIC CHMSL INCLUDING A HOLOGRAM ASSEMBLY AND A REFRACTIVE ELEMENT LAMINARLY ATTACHED THERETO FOR DIVERGING ZERO ORDER BEAM

Gaylord E. Moss, Marina del Rey, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 1, 1993, Ser. No. 146,244

Int. Cl.[6] G03H *1/00;* **G02B** *5/32;* **B60Q** *1/44;1/26*

U.S. Cl. 359—13 **16 Claims**

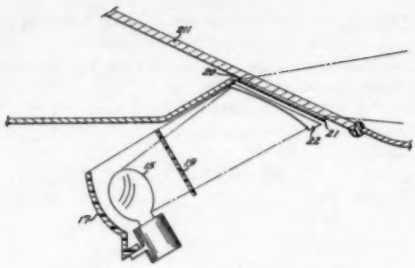
1. A holographic stoplight system comprising:

means for providing a near collimated beam;

an expanding lens responsive to the nearly collimated beam for providing a diverging reconstruction beam;

a stoplight hologram assembly responsive to the diverging reconstruction beam for producing stoplight illumination; and

wherein said expanding lens and said hologram assembly are laminarly attached to each other.

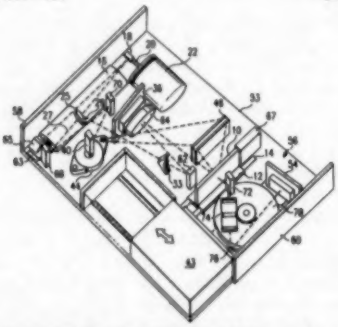


5,488,494

PACKAGING SYSTEM FOR HOLOGRAPHIC STORAGE MEDIA

Stephen R. Redfield; Gerald R. Willenbring; John Stockton, and Edward A. Halter, all of Austin, Tex., assignors to Tamarack Storage Devices, Austin, Tex.

Filed Oct. 7, 1993, Ser. No. 133,672
Int. Cl.[6] G03H 1/26
U.S. Cl. 359—22 25 Claims



7. A holographic storage system, comprising:

a portable holographic storage media, said portable holographic storage media having:

an optically transmissive substrate,

a media layer of photosensitive photopolymer material disposed on said substrate,

an optically transmissive cupping layer disposed on the surface of said media opposite said substrate,

said substrate, said media layer and said cupping layer forming a slide having a plurality of storage locations formed within said media layer for storing holographic recordings of the Fourier transform of a data image, and

an opaque jacket containing said slide with one end open to allow said slide to be removed therefrom for reading of information therefrom and writing of information thereto, and for inserting of said slide back into said jacket;

a beam generation system for generating a data beam and a reference beam, the data beam having a data image encoded therein that represents digital data;

a slide holder;

a slide retrieval system for retrieving the slide from said jacket and disposing it in the slide holder, said slide retrieval system operable in the reverse operation to remove said slide from said slide holder and dispose it in said associated jacket;

a beam positioning system for positioning said data beam and said reference beam onto a select one of said storage locations when said slide is disposed in said slide holder;

a detection device for detecting data from a reconstructed data beam during a playback operation; and

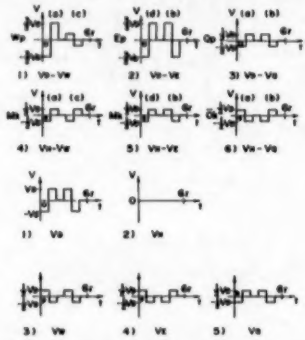
a system controller for controlling said beam positioning system to position said data beam and said reference beam to said select location in response to an external addressing signal, and controlling said beam generation system to generate said data beam and said reference beam during a record operation, and only said reference beam during a playback operation, such that a reconstructed data beam is generated for detection by said detection device during a playback operation.

5,488,495

DRIVING METHOD FOR A FERROELECTRIC LIQUID CRYSTAL DISPLAYS HAVING NO CHANGE DATA PULSES

Takaji Numao, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 759,780, Sep. 13, 1991, abandoned, which is a continuation of Ser. No. 670,388, Mar. 15, 1991, abandoned, which is a continuation of Ser. No. 238,860, Aug. 31, 1988, abandoned. This application May 5, 1993, Ser. No. 56,948
Claims priority, application Japan, Aug. 31, 1987, 62-218290
Int. Cl.[6] G02F 1/141; G09G 3/36
U.S. Cl. 359—56 5 Claims



1. A method of driving a liquid crystal display device including a ferroelectric display material, a plurality of parallel scanning electrodes disposed in a first direction, a plurality of parallel signal electrodes intersecting the plurality of parallel scanning electrodes and disposed in a second direction perpendicular to the first direction, and picture elements formed at each signal and scanning electrode intersection, each picture element being switched to a bright display state, when a voltage difference between a scanning and signal electrodes associated with the picture element exceeds a first threshold voltage (+Va), and being switched to a dark display state, when said voltage difference falls below a second threshold voltage (−Vb), wherein the first threshold voltage is greater than the second threshold voltage, said method comprising the steps of:

(a) storing a previous display state for each picture element;

(b) determining, for each picture element, one of three previous to new display state scenarios, wherein,

(i) a first scenario (X), occurs when the previous and new display states of the picture element are a dark display state and a bright display state, respectively,

(ii) a second scenario (Y), occurs when the previous and new display states of the picture element are a bright display state and dark display state, respectively, and

(iii) a third scenario (Z), occurs when the new display state of the picture element is the same as the previous display state;

(c) applying a first voltage pattern when said first scenario (X) is determined, the first voltage pattern having a peak voltage greater than the first threshold voltage, wherein an integrated value of the first voltage pattern is equal to zero;

(d) applying a second voltage pattern when said second scenario (Y) is determined, the second voltage pattern having a peak

voltage smaller than the second threshold voltage, wherein an integrated value of the second voltage pattern is equal to zero; and

(e) applying third voltage patterns when said third scenario (Z) is determined, the third voltage patterns having a peak voltage between the first and second threshold voltages, wherein an integrated value of the third voltage patterns is equal to zero, the third voltage patterns applied to picture elements of a selected scanning electrode and a non-selected scanning electrode respectively having the same waveform and opposite polarities.

5,488,496

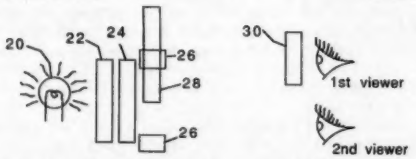
PARTITIONABLE DISPLAY SYSTEM

Jerrold S. Pine, 9555 Saddlebrook Dr., Boca Raton, Fla. 33496

Filed Mar. 7, 1994, Ser. No. 206,660

Int. Cl.[6] G02F *1/1335*

U.S. Cl. 359—63 **23 Claims**



1. An apparatus for displaying images on a liquid crystal display having partitionable selectively visible regions, comprising:

first polarizing means for forming planer polarized light background from incident light;

a liquid crystal display panel for forming images cross-polarized with polarized light background in substantially parallel alignment with said first polarizing means having a front side displaying said images;

moveable polarizing means for selectively covering at least a region of liquid crystal display panel, disposed in substantially parallel alignment with said liquid crystal display panel, disposed at the front side of said liquid crystal display panel, opposite said first polarizing means;

remote polarizing means disposed away from said liquid crystal display having polarization relative to said movable polarizing means which is one of planar-polarization or cross-polarization; said remote polarization means operative for enabling a viewer looking through said remote polarizing means to view said images both covered and uncovered by said movable polarizing means; and wherein said regions uncovered by said movable polarizing means are invisible for viewing without said remote polarizing means;

moving means connected to said movable polarizing means for displacing said movable polarizing means.

5,488,497

COLOR LIQUID CRYSTAL DEVICE WITH ORGANIC SMOOTHING LAYER OVER ITO SEPARATED BY AN OXIDE LAYER AND A NITRIDE LAYER

Hiroshi Takanashi, Soraku; Masami Ogura, Kashihara, and Masahiro Tanimoto, Daito, all of, Japan, assignors to Sharp Kabushiki Kaisha, and Sanyo Vacuum Industries Co, Ltd., both of Osaka, Japan

Filed Nov. 2, 1993, Ser. No. 144,445

Claims priority, application Japan, Nov. 2, 1992, 4-294541

Int. Cl.[6] G02F *1/13*

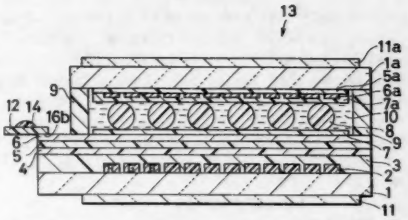
U.S. Cl. 359—74 **6 Claims**

1. A color liquid crystal display device comprising:

a pair of light-transmitting substrates;

a liquid crystal layer interposed between said pair of light-transmitting substrates;

a color filter formed on one of said pair of light-transmitting substrates;



an organic protection film and an electrode film formed on said color filter;

a metallic or silicon nitride film interposed between said organic protection film and said electrode film; and

a metallic or silicon oxide film interposed between said metallic or silicon nitride film and said electrode film.

5,488,498

LIQUID CRYSTAL DISPLAY WITH PARTICULAR CONTACTS FOR SUPPLYING COUNTER ELECTRODE POTENTIAL

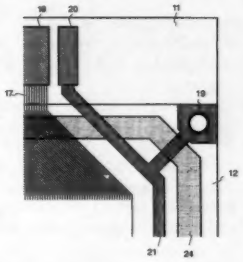
Yoshiharu Fujii, Sagamihara, and Toshihiko Yoshida, Yokohama, both of, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 23, 1994, Ser. No. 216,865

Claims priority, application Japan, Mar. 23, 1993, 5-063847

Int. Cl.[6] G02F *1/1343*

U.S. Cl. 359—88 **9 Claims**



1. A liquid crystal display having a first and a second transparent substrate with sealed liquid crystal therebetween, said first transparent substrate having a plurality of scan lines and a plurality of signal lines formed therein, said second transparent substrate having a transparent counter electrode formed therein, comprising:

transfer lead electrodes formed in said first transparent substrate at first, second and third sides of said liquid crystal display, for simultaneously applying counter electrode potential at each of said sides;

an extended conductor electrically connected to at least one of said transfer lead electrodes and extending along a fourth side of said liquid crystal display, said extended conductor being located inside of a liquid crystal seal; and

a plurality of transfers at said first, second, third and fourth sides electrically connecting said transparent counter electrode to said transfer lead conductors, in order to allow counter electrode potential to be applied to said transparent counter electrode simultaneously at said first, second, third and fourth sides via said transfers, said transfers at said fourth side being located outside of said liquid crystal seal and being electrically connected to at least one of said transfer lead electrodes via said extended conductor, thereby not requiring additional transfer lead electrodes at said fourth side.

5,488,499

LIQUID CRYSTAL DISPLAY DEVICE UTILIZING A CHIRAL NEMATIC LIQUID CRYSTAL MEDIUM OPERATIVE RELATIVE TO TWO METASTABLE STATES

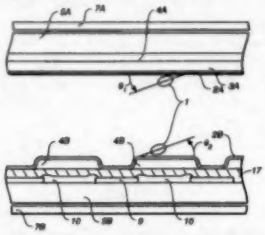
Takaaki Tanaka, and Yuzuru Sato, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Jul. 15, 1993, Ser. No. 93,290

Claims priority, application Japan, Jul. 16, 1992, 4-189436; Jul. 23, 1992, 4-197034; Aug. 17, 1992, 4-217931; Jan. 1, 1992, 4-263836; Dec. 18, 1992, 4-339051; Jul. 14, 1993, 5-195601

Int. Cl.[6] G02F *1/13;1/1335*

U.S. Cl. 359—102 21 Claims



1. A liquid crystal electrooptical element, comprising:

a pair of substrates,

a group of substantially parallel electrodes formed on a first major surface of each of said substrates,

alignment films formed over said electrode groups of each of said substrates, a surface of each of said alignment films treated to have an alignment direction formed thereon,

polarizing plates disposed relative to a second major surface of each of said substrates,

said substrates disposed in spatial relation forming a gap therebetween with the alignment direction of said respective alignment films forming a twist angle, ϕ_r, relative to each other,

a chiral nematic liquid crystal medium provided in said gap wherein the helical pitch, P_o, of said chiral nematic liquid crystal medium is adjusted such that an initial twist angle of said chiral nematic liquid crystal medium in an initial state prior to application of an applied voltage to said electrodes is substantially equal to the angle, ϕ_r, which is formed between the respective alignment directions formed on the alignment films,

pretilt angles formed in said initial state by molecular director vectors of liquid crystal molecules comprising said chiral nematic liquid crystal medium at said alignment film surfaces having mutually opposite signs,

said chiral nematic liquid crystal medium capable of relaxing to one of two metastable states, each of which has a period of memory retention, after application of an applied voltage waveform in said initial state wherein the twist angles of said liquid crystal medium in said metastable states respectively approximate $\phi_r+180°$ and $\phi_r-180°$,

polarization axes angles P, A of said polarizing plates formed by the polarization axis of one of each of said polarizing plates relative to one of said

respective alignment film alignment directions set according to (1) a value of product R (=d·Δn) where d is the layer thickness of said liquid crystal medium and where Δn of said liquid crystal medium is the apparent difference in the refractive indices of the liquid crystal medium for extraordinary light, n_e, and ordinary light, n_o, ($\Delta n=n_e-n_o$), and (2) twist angle, ϕ_r, so that one of said metastable states is an ON display state and the other of said metastable states is an OFF display state, and

a ratio of said layer thickness, d, of said liquid crystal medium to said helical pitch, P_o, of said liquid crystal medium is within the range of $0.8\ \phi_r/360° \leqq d/p_o \leqq 1.4\ \phi_r/360°$.

5,488,500

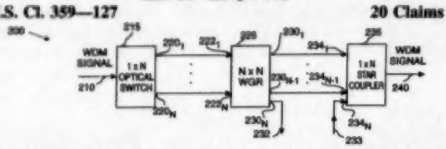
TUNABLE ADD DROP OPTICAL FILTERING METHOD AND APPARATUS

Bernard Glance, Colts Neck, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Aug. 31, 1994, Ser. No. 298,820

Int. Cl.[6] H04J *14/02*

U.S. Cl. 359—127 20 Claims



1. An optical filter for use with wavelength division multiplexed signals comprising a plurality of frequency components, the optical filter operable to remove at least one frequency component from a wavelength division multiplexed signal, the optical filter comprising:

a) a wavelength grating router, the router including a plurality of inputs and a plurality of outputs, the plurality of outputs further comprising a set of one or more drop outputs, the router operable such that when an input signal comprising a plurality of frequency components is received at one of the router inputs, each frequency component of the input signal is provided at a distinct output, and the distinct output at which each frequency component is provided is dependant upon the router input at which the input signal is received;

b) an optical switch comprising an input and a plurality of outputs connected to the wavelength grating router, each switch output connected to one of the plurality of router inputs, the switch operable to receive an optical signal at the switch input and provide the received optical signal at a select one of the plurality of switch outputs; and

c) a multiplexer for wavelength division multiplexing a plurality of frequency components, the multiplexer coupled to less than all of the plurality of waveguide grating router outputs.

5,488,501

OPTICAL PROCESSING SYSTEM

Peter E. Barnsley, Suffolk, United Kingdom, assignor to British Telecommunications plc, London, England

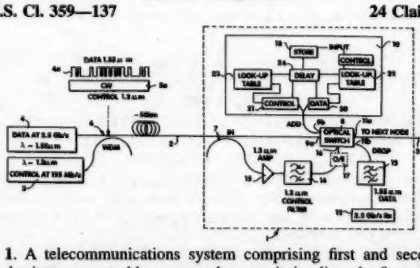
PCT No. PCT/GB93/00747, § 371 Date Jun. 15, 1994, § 102(e) Date Jun. 15, 1994, PCT Pub. No. WO93/21706, PCT Pub. Date Oct. 28, 1993

PCT Filed Apr. 8, 1993, Ser. No. 244,934

Claims priority, application United Kingdom, Apr. 9, 1992, 9207937; European Pat. Off., Dec. 9, 1992, 92311238.7

Int. Cl.[6] H04J *14/08*

U.S. Cl. 359—137 24 Claims



1. A telecommunications system comprising first and second nodes interconnected by a network transmission line, the first node comprising an optical data generator for producing an optical data signal at a first wavelength, an optical header generator for producing an optical control signal at a second wavelength, means for multiplexing the data and control signals onto the transmission line in such a manner that the duration of the control signal is at least equal to the duration of the data signal, a delay unit coupled with the optical data generator and the optical header generator and control means coupled with the delay unit for providing a sufficient

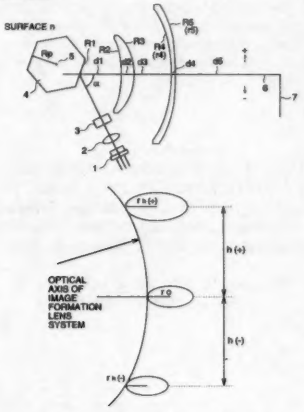
delay between the transmission start times of the controller and data signals to ensure that the control signal completely overlaps the data signal on arrival at the second node, the second node comprising a switch and a controller coupled to the transmission line, said controller being coupled to said switch and responsive to signals at the second wavelength for controlling the routing of optical signals through the switch.

5,488,502

LIGHT BEAM SCANNING DEVICE AND IMAGE FORMATION LENS

Shinichiro Saito, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Oct. 11, 1994, Ser. No. 321,318
Claims priority, application Japan, Jan. 14, 1993, 5-280325
Int. Cl.[6] G02B *26/08*
U.S. Cl. 359—205 **24 Claims**



1. An apparatus for scanning an image forming surface with a laser beam, comprising:

a laser generator for generating a laser beam;

a rotatable polygonal mirror, having an axis of rotation, for deflecting the laser beam to scan the image forming surface in a primary scanning direction; and

an image formation lens system, including a lens, provided between the polygonal mirror and the image forming surface, for focusing the laser beam on the image forming surface, the lens system having an optical axis,

the polygonal mirror being arranged in relation to the optical axis of the lens system in such a manner that the rotation axis of the polygonal mirror is deviated to one side of the optical axis of the lens system, wherein the one side is defined as a "+" side and an opposite side is defined as a "–" side,

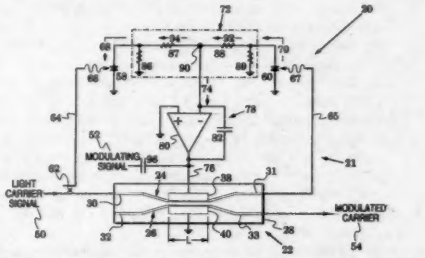
the lens of the lens system having a cylindrical surface facing the polygonal mirror, wherein the cylindrical surface is curved in a secondary scanning direction, a radius of curvature "rh" represents a radius of curvature of the cylindrical surface in a plane perpendicular to the primary scanning direction at a distance h from the optical axis in the primary scanning direction, a change pattern in the radius of curvature "rh" is non-symmetrical in relation to the optical axis, and "rh(–)" is smaller than "r_0, wherein "rh(–)" is the radius of curvature "rh" at each point on the "–" side and "r_0" is the radius of curvature at a point on the optical axis.

5,488,503

LOW-POWER, STABILIZED, PHOTONIC MODULATOR SYSTEM

James H. Schaffner, Chatsworth, and Mark B. Hammond, Irvine, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 9, 1995, Ser. No. 386,050
Int. Cl.[6] G02F *1/225*
U.S. Cl. 359—245 **19 Claims**



1. A control loop for stabilizing the operation of a light intensity modulator that is configured to deliver an intensity modulated light signal at an output port in response to a carrier light signal at a first input port and a modulating voltage signal at a second input port, the network comprising;

a reference photodetector arranged to produce a reference signal in response to the intensity of said carrier signal;

a feedback photodetector arranged to produce a feedback signal in response to the intensity of said modulated signal;

a comparison network configured to produce an error signal in response to said reference signal and said feedback signal; and

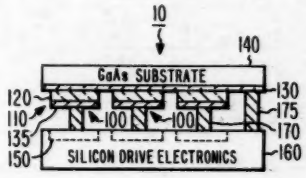
a loop processor configured to generate a bias signal at said second input port in response to said error signal.

5,488,504

HYBRIDIZED ASYMMETRIC FABRY-PEROT QUANTUM WELL LIGHT MODULATOR

Terrance L. Worchesky, Columbia, and Kenneth J. Ritter, Sykesville, both of Md., assignors to Martin Marietta Corp., Bethesda, Md.

Filed Aug. 20, 1993, Ser. No. 109,550
Int. Cl.[6] G02F *1/03*
U.S. Cl. 359—248 **10 Claims**



1. A spatial light modulator including quantum wells and Fabry-Perot etalons, comprising:

(A) a transparent non-semiconductor dielectric substrate having a first composition transparent to photons within a particular energy range, and having a first index of refraction;

(B) said spatial light modulator further including a plurality of modulator pixels responsive to said photons within said particular energy range, each of said pixels comprising:

(1) a partially reflective dielectric mirror and common electrical contact layer adjacent to said transparent substrate, said dielectric mirror and common electrical contact layer comprising (a) a first layer of a first semiconductor material, having an index of refraction higher than that of said

transparent substrate, said first layer of said first semiconductor material being adhesively affixed to said transparent substrate, whereby the junction between said transparent substrate and said first layer of said first semiconductor material is a relatively wavelength independent mirror, said dielectric mirror and common electrical contact layer further comprising (b) a plurality of additional layers, at least one of which is electrically conductive, said additional layers including alternating layers of a second semiconductor material and said first semiconductor material, said second semiconductor material having an index of refraction lower than that of said first semiconductor material;

(2) a quantum well layer supported by that side of said dielectric mirror and common electrical contact layer remote from said first layer of said dielectric mirror and common electrical contact layer, said quantum well layer including a plurality of alternating layers of (a) third semiconductor material having a particular ground energy state, and (b) a further semiconductor material having a ground energy state higher than said particular ground energy state, whereby said quantum well layer includes a plurality of quantum wells;

(3) an optically non-transmissive metallic mirror layer; and

(4) means for mechanically and electrically coupling said metallic mirror layer to said quantum well layer; said modulator further comprising:

(C) an electronics section including drive electronics for generating a plurality of individual electrical drive signals; and

(D) coupling means coupled to said drive electronics, to said electrically conductive layer of said dielectric mirror and common electrical contact layer, and to said metallic mirror layers of said pixels of said modulator, for coupling each of said individual electrical drive signals to said metallic mirror layer of a different one of said pixels.

5,488,505

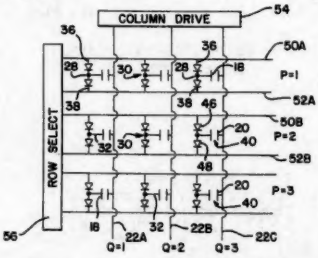
ENHANCED ELECTROSTATIC SHUTTER MOSAIC MODULATOR

Craig D. Engle, 336 Cline Ave., Griffith, Ind. 46319

Filed Oct. 1, 1992, Ser. No. 955,058

Int. Cl.[6] G02F *1/29*

U.S. Cl. 359—292 **17 Claims**



15. An enhanced electrostatic spatial light modulator for use in modulating an electromagnetic wavefront incident thereon in electronic to optical data conversion applications comprising:

an insulating substrate, said substrate further includes a first major surface and a second major surface,

said first major surface and said second major surface are opposing surfaces,

a plurality of first electrodes arranged into a matrix of p rows and q columns, each said first electrode is affixed to said substrate by a suitable means,

overlapping each said first electrode is a respective reflective conductor,

each said conductor is affixed to said first major surface by a suitable conductor affixing means,

the conductors which are overlapping said first electrodes in each column q are electrically connected,

said suitable conductor affixing means further includes means for electrically connecting the conductors in each column q so as to be electrically isolated from the conductors in every other column q,

a plurality of thin film transistors, each said thin film transistor further includes a drain electrode, a gate electrode and a source electrode,

each said first electrode is electrically connected by a suitable feedthrough means to a respective thin film transistor,

each said transistor is affixed by a suitable means to said second major surface,

the gate electrodes of said transistors which are electrically connected to said first electrodes in each row p are electrically connected by a respective row select buss,

each said respective row select buss is affixed by a suitable means to said second major surface,

a plurality of common busses electrically connecting the source electrodes of said transistors to a common potential source,

each said common buss is affixed to said second major surface by a suitable means,

each said common buss is essentially parallel to every said respective row select buss thereby eliminating electrical crossover networks,

a suitable potential control means to control an applied potential difference between each said first electrode and the respective conductor in accordance with an information bearing signal so as to enhance the commercial viability of the modulator.

5,488,506

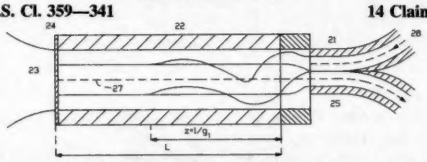
ENHANCED POWER FIBER LASER WITH CONTROLLABLE OUTPUT BEAM

Sergej G. Krisvoshlykov, Moscow, Russian Federation, and Wolfgang Neuberger, Monchen-Gladbach, Germany, assignors to CeramOptec Industries, Inc., East Longmeadow, Mass.

Filed Jun. 9, 1994, Ser. No. 257,547

Int. Cl.[6] H01S *3/098*

U.S. Cl. 359—341 **14 Claims**



1. An active graded-index fiber for use in a fiber laser having a controllable output beam, said fiber having an axis, a core of radius a, and a cladding, said active fiber has a complex refractive index distribution described by the refractive index distribution function:

$$n^2(r)=n^{o2}-\omega^2(z)r^2;\ 0\leq r<a$$

$$n^2(r)=n_o^2-\omega^2a^2=n_{cl}^2;r\geq a$$

wherein r represents the distance from the said axis, n_o represents the refractive index at said axis, and n_{cl} denotes the refractive index of said cladding, said active fiber has a complex gradient parameter g described by the gradient function:

$$g=g_r-ig_i=w/n_o$$

wherein ω is the amplification gradient and equals $(2n_o(n_o-n_{cl}))^{1/2}$, said parameter g depends upon a propagation distance z and is described by the periodic function:

$$g^2(z)=g^2(1+4h\cos 2g_rz);\ h<1,\ g_i<g_r$$

wherein parameter h represents the amplitude of modulation of said output beam, said output beam has a period of modulation Λ equal to π/g_r and to one half of the oscillation of said output beam, said parameter h is chosen to guide only one guidemode in said active fiber.

5,488,507

SEMICONDUCTOR OPTICAL AMPLIFIER HAVING REDUCED POLARIZATION DEPENDENCE

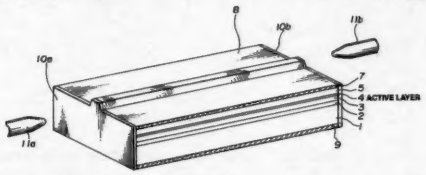
Michiyo Nishimura, Sagamihara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1994, Ser. No. 306,400

Claims priority, application Japan, Jan. 4, 1993, 5-271330

Int. Cl.[6] G02F *02/00*

U.S. Cl. 359—344 **6 Claims**



1. A semiconductor optical device comprising:

a substrate; and

an active layer of quantum well structure, said active layer including a plurality of well layers and a plurality of barrier layers which are alternately layered, said well layers having different quantum levels and said barrier layers being respectively subjected to biaxial strain,

wherein each of said plurality of well layers has a polarization dependency and said plurality of well layers compensate for each polarization dependency of each other or one another.

5,488,508

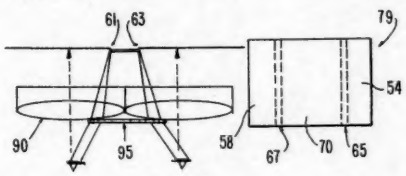
VIGNETTING TECHNIQUE FOR IMPROVING APPEARANCE OF PARTIALLY OVERLAPPED BINOCULAR DISPLAYS

Eric C. Haseltine, Manhattan Beach, Calif., assignor to The Walt Disney Company, Burbank, Calif.

Filed Jun. 28, 1994, Ser. No. 267,187

Int. Cl.[6] G02B *21/36;23/08;26/08;27/00*

U.S. Cl. 359—362 **28 Claims**



1. A virtual reality system having a partially overlapped binocular display for displaying simulated three dimensional images to an observer, the partially overlapped binocular display comprising,

a generator of a first image having a first boundary;

a generator of a second image having a second boundary; wherein:

the first and second images are generated such that a predetermined portion of the first image overlaps a predetermined portion of the second image thereby forming a first nasal portion of the first boundary which overlaps the second image and a second nasal portion of the second boundary which overlaps the first image, the system further comprising:

an aperture step positioned in front of the first and second images, and closer to an eye of the observer than the focal renee or said eye, so as to substantially block the observer's view of the left nasal boundary and the right nasal boundary, the aperture stop being substantially out of focus to the observer.

5,488,509

LIGHT SOURCE APPARATUS FOR ENDOSCOPE

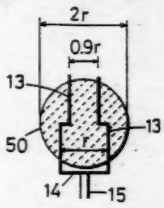
Tadashi Takahashi; Tetsuya Utsui; Rensuke Adachi; Mitsuru Iida; Katsuhiko Furuya; Junji Usami, and Ryoji Honda, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1994, Ser. No. 281,083

Claims priority, application Japan, Aug. 19, 1993, 5-045135 U; Jun. 8, 1994, 6-125604

Int. Cl.[6] G02B *21/06;* **A61B** *1/06*

U.S. Cl. 359—385 **22 Claims**



1. A light source apparatus for an endoscope comprising a light source for emitting a bundle of illuminating light rays to be supplied to a light guide of the endoscope, said light source apparatus comprising:

at least a pair of light-blocking plates disposed in the bundle of illuminating light rays to face each other across an optical axis of the bundle of illuminating light rays;

means for rotatably supporting said light-blocking plates such that said light-blocking plates are rotatable about an axis extending between said light-blocking plates perpendicular to the optical axis of said bundle of illuminating light rays; and

at least one of said light-blocking plates comprises a cross-sectional configuration, as viewed in the direction of said optical axis of the bundle of illuminating light rays when said light-blocking plates lie parallel to said optical axis, such that said at least one light-blocking plate is bent at an angle to said axis of rotation at a position near a center of said illuminating optical path,

said light blocking plates having a shape such that a ratio between a peripheral portion of the bundle of illuminating light rays and a central portion of the bundle of illuminating light rays is maintained substantially constant as said pair of light blocking plates are rotated by said rotatable supporting means between blocking and nonblocking positions, said central portion of said bundle of illuminating light rays and said peripheral portion of said bundle of illuminating light rays being defined such that when said light blocking plates are in said nonblocking position, the luminous flux of said central portion of the illuminating light rays is equal to the luminous flux of said peripheral portion of the illuminating light rays.

5,488,510

ENHANCED DEPTH PERCEPTION VIEWING DEVICE FOR TELEVISION

Edward J. LeMay, 2219 Ludington-P.O. Box 212, Escanaba, Mich. 49829-0212

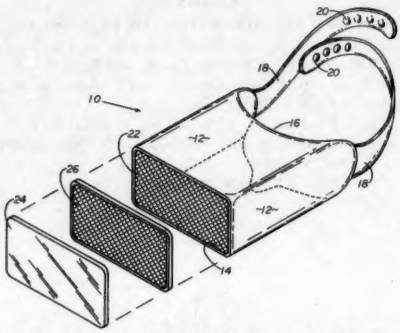
Filed Jul. 26, 1994, Ser. No. 280,723

Int. Cl.[6] G02B *27/22*

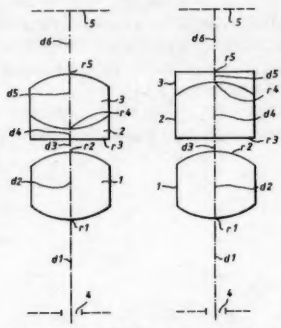
U.S. Cl. 359—478 **14 Claims**

1. An optical television viewing device comprising a hollow body having a front opening and a back opening and at least one opaque sidewall extending about the periphery of the front opening and the periphery of the back opening, the periphery of the back opening being formed for substantially light-tight engagement with the face of a user,

the improvement comprising an open mesh screening across the front opening and extending to the periphery of the front



opening, the warp and weave of the mesh screening extending diagonally across the front opening relative to the viewer's eyes.



said second component having at least one planar surface; and, said second component being a composite lens consisting of first and second elements.

5,488,511

SPATIALLY TUNABLE RUGATE NARROW REFLECTION BAND FILTER

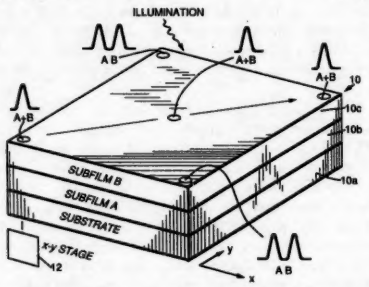
Thomas D. Rahmlow, Jr., Bethlehem, Conn., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 3, 1992, Ser. No. 862,858

The portion of the term of this patent subsequent to Jul. 11, 2012, has been disclaimed.

Int. Cl.[6] **G02B** *1/10;5/28*

U.S. Cl. 359—586 **19 Claims**



1. An optical filter having a radiation receiving surface, said filter comprising a rugate reflection filter having a reflection wavelength that varies along an axis of the radiation receiving surface.

5,488,512

COLOR CORRECTED OCULAR

Franz Muchel, Königsbronn, Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Germany

Filed Jun. 28, 1994, Ser. No. 266,622

Claims priority, application Germany, Jul. 2, 1993, 43 22 015.0

Int. Cl.[6] **G02B** *25/00;13/18;9/06*

U.S. Cl. 359—646 **9 Claims**

1. A color corrected ocular comprising:

first and second components;

said first component being an individual lens having an aspherical surface;

said second component having at least one planar surface; and,

said second component being a composite lens consisting of first and second elements.

5,488,513

ZOOM LENS BARREL

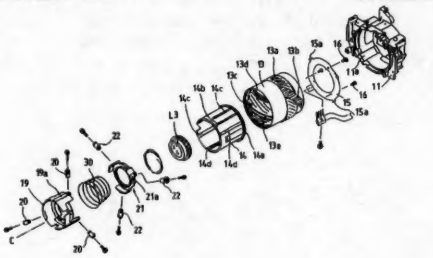
Hitoshi Tanaka, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1993, Ser. No. 106,574

Claims priority, application Japan, Aug. 17, 1992, 4-217919

Int. Cl.[6] **G03B** *7/00*

U.S. Cl. 359—699 **14 Claims**



1. A zoom lens barrel, comprising:

a cam ring that is threadedly engaged to a female helicoid formed in a stationary barrel mechanism;

linear movement guide means, mounted for rotation relative to said cam ring, and for movement in an optical axis direction together with said cam ring;

at least three movable lens groups, including first, second and third lens groups that are guided in said optical axis direction by said linear movement guide means, said first, second and third lens groups being located in this order from an object side of said zoom lens barrel;

a first lens frame that holds said first lens group and is provided with a helicoid, wherein another helicoid is formed on said cam ring to engage with said helicoid of said first lens frame; and,

a plurality of cam grooves formed on said cam ring to drive lens groups behind said first lens group.

5,488,514

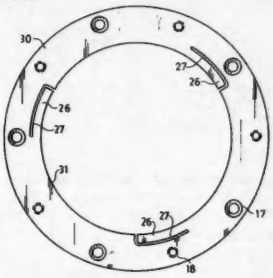
METHOD OF MOUNTING AN OPTICAL ELEMENT

John H. Bruning, Pittsford; Frank A. DeWitt, Holcomb, and Keith E. Hanford, Macedon, all of N.Y., assignors to General Signal Corporation, Stamford, Conn.

Division of Ser. No. 79,976, Jun. 18, 1993, Pat. No. 5,428,482, which is a continuation of Ser. No. 787,785, Nov. 4, 1991, abandoned. This application Mar. 16, 1995, Ser. No. 404,924

Int. Cl.[6] G02B *7/02*

U.S. Cl. 359—811 4 Claims



1. A method of mounting an optical element, said method using a seating ring flexibly held within an annulus by three flexible elements extending between the ring and the annulus, and said method comprising:

a. arranging said optical element on a fixture that holds said optical element coaxially adjacent said seating ring;

b. preloading said seating ring with weight approximating the weight of said optical element;

c. bonding said optical element to said seating ring while said fixture supports said optical element and said seating ring upholds said preload weight; and

d. removing said preload weight from said seating ring and removing said fixture from said optical element to leave said seating ring supporting said optical element.

5,488,515

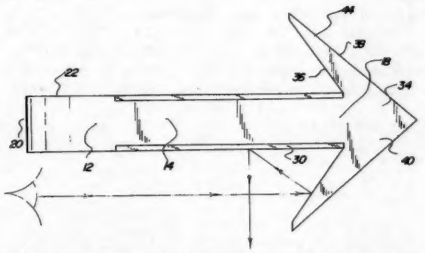
HOOD MOUNTED SAFETY MIRROR FOR VEHICLES

David D. Rachels, Sr., 2318 Floral Dr., Niles, Mich. 49120

Filed Dec. 14, 1994, Ser. No. 355,535

Int. Cl.[6] G02B *5/08;7/182;* B60R *1/06*

U.S. Cl. 359—855 4 Claims



1. A hood mounted safety mirror for vehicles for allowing a driver to see what road conditions are on both sides of the road comprising, in combination:

an elongated stem portion having a top surface, a bottom surface, a front portion, a back portion, and two side portions, the bottom surface having a rubber pad theresecured, the rubber pad serving to prevent the stem portion from scratching a hood of a car, the bottom surface having a plurality of slotted apertures therethrough, the two side portions each having an elongated mirror secured thereto;

an arrow portion integral with the front portion of the stem portion, the arrow portion having an inner surface, an outer surface, a top surface, a bottom surface, and two outwardly extending side portions, the bottom surface having a rubber pad theresecured, the bottom surface having a plurality of slotted apertures therethrough, the inner surface of the two outwardly extending portions having an elongated recess therein, each elongated recess having a mirror secured therein, each of the two outwardly extending side portions being angled at a position as such to allow a driver to view obstructions off to a side of the car as reflected from the mirrors on the side portions of the stem portion to the mirrors within the recess of the outwardly extending side portions to eyes of the driver;

a plurality of securement means, each of the securement means removably securing the stem portion and the arrow portion to a center portion of the hood of a car through the slotted apertures thereof.

5,488,516

APPARATUS FOR REPRODUCING N DIGITAL SIGNALS FROM N ADJACENT TRACKS ON A RECORD CARRIER

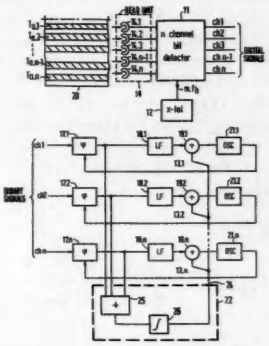
Johannes J. W. Kalfs, and Franciscus A. Kneepkens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 17, 1994, Ser. No. 214,913

Claims priority, application European Pat. Off., May 7, 1993, 93201327

Int. Cl.[6] G11B *5/09;15/12*

U.S. Cl. 360—51 6 Claims



1. An apparatus for reproducing n digital signals from n adjacent tracks included on a record carrier, the apparatus comprising:

read means for reading n information signals from the n tracks;

detection means for deriving the n digital signals from n binary signals derived from the n information signals;

n phase-locked loops which each receives a respective one of the n binary signals, each phase-locked loop including (a) a phase comparator having a first input for receiving one of the n binary signals, a second input and an output for supplying a comparison signal; and (b) a voltage-controlled oscillator having an input coupled to the output of the phase comparator, and an output for supplying a clock signal of a given frequency, which output is coupled to the second input of the phase comparator;

control signal generator means for deriving from the comparison signals supplied by the phase comparators of the n phase-locked loops a control signal which is a measure of the deviation of the relative speed of transport of the record carrier with respect to the read means from the nominal relative speed of transport of the record carrier with respect to the read means, the control signal generator means having (a) n inputs which are each coupled to the output of a respective one of the phase comparators of the n phase-locked loops for receiving the comparison signals supplied by the phase comparators of the n phase locked loops, and (b) a separate output for supplying the control signal; and

combination means for (a) combining the control signal with each of the comparison signals supplied by the phase comparators of the n phase locked-loops separately to produce a respective combination signal for each of the n phase-locked loops, and (b) supplying each respective combination signal to the input of the voltage controlled oscillator of the phase-locked loop for which that respective combination signal is produced, the combination means coupling the output of the phase comparator and the input of the voltage controlled oscillator of each phase locked-loop of the n phase-locked loops together and with the output of the signal control generator means.

5,488,517

SYSTEM COMPRISING A MAGNETIC-TAPE CASSETTE AND A MAGNETIC-TAPE APPARATUS, AND MAGNETIC-TAPE CASSETTE, TAPE-CLEANING MEANS AND TAPE-CLEANING ELEMENT FOR USE IN THE SYSTEM

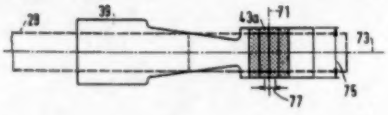
Gerardus W. A. Akkermans, Breda; Augustinus L. Braun, and Sander J. Klerk, both of Eindhoven, all of, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 4, 1993, Ser. No. 131,506

Claims priority, application European Pat. Off., Jan. 8, 1992, 92200093

Int. Cl.[6] G11B *5/09;23/02*

U.S. Cl. 360—53 **22 Claims**



1. A system, comprising:

a magnetic-tape cassette comprising a housing, a magnetic tape transportable within said housing, and a tape cleaning element engageable with said magnetic tape; and

a magnetic-tape apparatus having a magnetic head for communicating information in digital form with the magnetic tape accommodated in the housing of the magnetic-tape cassette, said magnetic-tape apparatus comprising error correction means for correcting errors in the digital information read from the magnetic tape, which information is stored on the magnetic tape in a plurality of parallel longitudinal tracks in successive information blocks in the longitudinal direction of the magnetic tape, the error-correction means being capable of correcting a maximum number of n successive information blocks on the magnetic tape,

the dimension of the active surface of the tape-cleaning element in a direction parallel to the longitudinal axis of the magnetic tape is smaller than the overall longitudinal dimension of two times n information blocks, whereby the error correction means is capable of at least substantially correcting read errors which occur as a result of soiling of the magnetic tape over the dimension of the active surface by the tape-cleaning element.

5,488,518

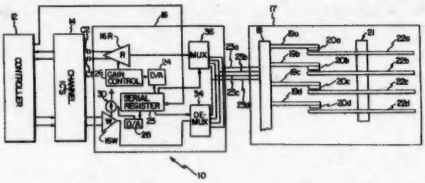
PROGRAMMABLE PRE-AMPLIFIER USING A SERIAL SHIFT REGISTER TO OUTPUT A PLURALITY OF CONTROL SIGNALS

John S. Shier, Apple Valley, Minn., assignor to VTC Inc., Bloomington, Minn.

Filed Aug. 15, 1994, Ser. No. 290,479

Int. Cl.[6] G11B *5/02;5/09*

U.S. Cl. 360—67 **3 Claims**



1. In a data storage system having a plurality of magnetic transducing means for storing and retrieving data signals on a magnetic medium and a controller for issuing instructions, a pre-amplifier comprising:

a read amplifier having an adjustable gain;

a write driver having an adjustable current source;

a serial shift register responsive to instructions from the controller to selectively operate the read amplifier and the write driver and produce control, signals;

a first digital-to-analog converter connected to the read amplifier and responsive to a control signal from the serial shift register to adjust the gain of the read amplifier;

a second digital-to-analog converter connected to the write driver and responsive to a control signal from the serial shift register to adjust the current source of the write driver;

a multiplexer means responsive to a control signal from the serial shift register to select one of the plurality of magnetic transducers and to connect the selected magnetic transducer to the read amplifier; and

a demultiplexer means responsive to a control signal from the serial shift register to select one of the plurality of magnetic transducers and to connect the selected magnetic transducer to the write driver.

5,488,519

RECORDING AND REPRODUCING DEVICE HAVING CONDUCTIVE SPINDLE

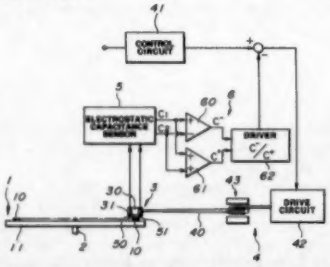
Takehisa Ishida, Tokyo, and Hiroshi Takino, Kanagawa, both of, Japan, assignors to Sony Corporation, Japan

Continuation of Ser. No. 140,273, Oct. 19, 1993, abandoned, which is a continuation of Ser. No. 681,320, Apr. 4, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 468,634

Claims priority, application Japan, Apr. 6, 1990, 2-91618

Int. Cl.[6] G11B *5/596;5/82;5/09*

U.S. Cl. 360—77.03 **6 Claims**



1. A recording and/or reproducing apparatus comprising:

head slider means having at least a pair of electrodes on a bottom surface thereof, said electrodes positioned opposite to concentric conductive magnetic stripes provided on a disc

said concentric conductive magnetic stripes being provided with conductive bridge stripes between adjacent ones of said conductive stripe, the conductive bridge stripes for storing additional information;

head arm means for supporting said head slider means;

head drive means coupled to said head arm means for moving said head slider means by way of said head arm means;

means for detecting capacitances between said electrodes and said concentric conductive magnetic stripes;

tracking error signal detecting means connected to said capacitance detecting means for generating tracking error signals;

means for feeding back said tracking error signals to said head drive means;

conductive spindle means for rotating said disc; and

at least one radial conductive stripe conductively connecting said concentric conductive magnetic stripes to said conductive spindle means.

5,488,520

DATA RECORDING AND PLAYBACK APPARATUS USING HELICAL SCAN SYSTEM WITH MAGNETIC HEAD FOR RECORDING AND PLAYING BACK PATTERN SIGNAL FOR TRACKING IN TRACKING AREA WITHIN HELICAL TRACK

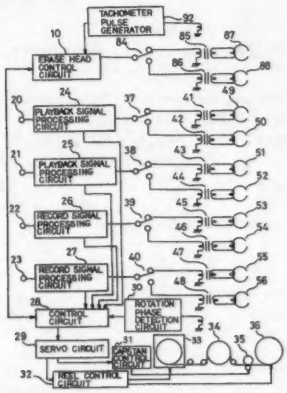
Toshiro Aizawa, Ebina, and Shigemitsu Higuchi, Fujisawa, both of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 2, 1993, Ser. No. 70,625

Claims priority, application Japan, Jun. 2, 1992, 4-141745

Int. Cl.[6] G11B *5/584;5/58;15/14*

U.S. Cl. 360—77.12 **23 Claims**



1. A data recording and playback apparatus using a helical scan system for recording and playing back data on a magnetic tape with a rotary head cylinder, said apparatus comprising:

a first magnetic head on the rotary head cylinder for scanning a recording track on said magnetic tape;

a recording magnetic head on the rotary head cylinder for scanning a data track within said recording track;

a playback magnetic head on the rotary head cylinder for scanning said data track;

means for recording a specific pattern in a tracking area within said recording track with said first magnetic head during a data recording operation of said apparatus, said tracking area not overlapping said data track;

means for recording data in said data track with said recording magnetic head during said data recording operation;

reference signal generating means for generating a reference signal at a timing indicative of a predetermined rotation phase of said rotary head cylinder;

means for playing back the data in said data track with said playback magnetic head during a data playback operation of said apparatus;

means for playing back said specific pattern in said tracking area with said first magnetic head during the data playback operation; and

tracking control means for detecting a difference between a playback timing of said specific pattern indicative of a timing at which said specific pattern is played back by said first magnetic head and the timing at which said reference signal is generated by said reference signal generating means, and for controlling tracking of said first magnetic head, said recording magnetic head, and said playback magnetic head based on said difference.

5,488,521

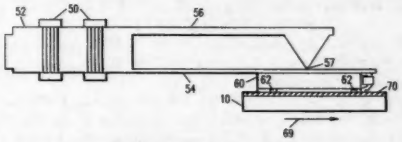
INFORMATION RECORDING APPARATUS WITH A NON-NEWTONIAN LIQUID BEARING

James U. Lemke, San Diegeo, and William W. French, Encinitas, both of Calif., assignors to Conner Peripherals, Inc., San Jose, Calif.

Continuation of Ser. No. 123,704, Sep. 17, 1993, abandoned, which is a continuation of Ser. No. 966,579, Oct. 26, 1992, abandoned, which is a continuation of Ser. No. 810,955, Dec. 19, 1991, abandoned, which is a continuation of Ser. No. 453,312, Dec. 20, 1989, Pat. No. 5,097,368, which is a continuation-in-part of Ser. No. 259,344, Oct. 17, 1988, abandoned. This application Mar. 7, 1994, Ser. No. 207,799

Int. Cl.[6] G11B *33/14*

U.S. Cl. 360—97.02 **20 Claims**



1. An information storage system comprising:

a substantially rigid rotatable storage medium having a magnetic data surface;

means for rotating the rotatable storage medium;

a magnetic transducer means;

means for maintaining a film of a non-Newtonian fluid on the magnetic data surface by applying the fluid to the magnetic data surface during rotation of the storage medium, the magnetic transducer means being supported adjacent to the magnetic data surface during rotation of the storage medium, by the film of the fluid.

5,488,522

EJECTION APPARATUS FOR EJECTING STORAGE MEDIA POSITIONED IN A COMPUTER MASS STORAGE MEDIA DRIVE

Steven L. Peace, Fort Collins, and Terry A. Precht, Loveland, both of Colo., assignors to ComByte, Inc., Ft. Collins, Colo.

Filed Nov. 14, 1994, Ser. No. 337,740

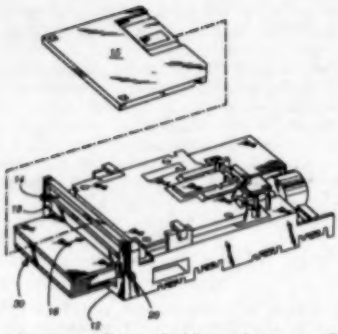
Int. Cl.[6] G11B *25/10*

U.S. Cl. 360—99.06 **9 Claims**

1. Manually operable storage media ejection apparatus for a computer mass storage media drive having a first insertion opening for removably receiving a first storage media at a first storage media receiving position, and having a second insertion opening for removably receiving a second storage media at a second storage media receiving position, said ejection apparatus comprising:

a first spring biased ejection force generating mechanism for generating a first ejection force that is operable to eject a first storage media out of said first storage media receiving position when a first storage media is positioned thereat,

a second spring biased ejection force generating mechanism for generating a second ejection force that is operable to eject a



second storage media out of said second storage media receiving position when a second storage media is positioned thereat; and

a single manually movable actuator cooperating with said first and second ejection force generating mechanism and operative, when said manually movable actuator is actuated, to initiate generation of said second and first ejection forces.

5,488,523

ULTRA-SLIM DISK STORAGE UNIT HAVING A HYDRODYNAMIC BEARING ASSEMBLY WHICH FORMS A STABLE MENISCUS

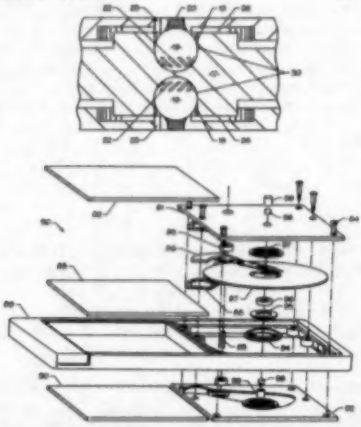
Jay R. Seaver, Longmont, Colo.; Mark A. Diel, Aptos, Calif., and Forrest Titcomb, Colorado Springs, Colo., assignors to Maxtor Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 881,739, May 6, 1992, Pat. No. 5,328,271. This application Jun. 9, 1993, Ser. No. 74,215

The portion of the term of this patent subsequent to Jul. 12, 2011, has been disclaimed.

Int. Cl.[6] **G11B** *17/02;33/12;* **H05K** *7/02;* **F16C** *32/06*

U.S. Cl. 360—99.12 **11 Claims**



1. An ultra-slim disk storage unit comprising:

a frame having first and second enclosed spaces, said spaces being disposed in the same general plane adjacent to each other;

disk drive assembly providing readable and writable information storage on a disk medium, said disk drive assembly comprising a hub and a hydrodynamic bearing disposed within said first enclosed space, said hub rotationally supporting said disk medium, said hydrodynamic bearing providing rotational movement of said hub within said first enclosed space about an axis of rotation, said hydrodynamic bearing comprising a pair of balls and a pair of sockets, each of said sockets having a spherical section and a cylindrical section, said pair of balls being disposed within said spherical sections of said pair of sockets, respectively, along said axis of rotation on opposite sides of said hub, either said pair of sockets or said pair of balls being affixed to said hub, wherein a gap is formed between each socket and its associated ball, said gap being filled with a liquid lubricant to facilitate rotational movement of said hub about said rotational axis, said lubricant forming a stable meniscus between each of said balls and said cylindrical section of each of said sockets, said disk drive assembly being contained within said first enclosed space;

an electronic circuit board for controlling the operation of said disk drive assembly, said electronic circuit board being housed on a board contained within said second enclosed space; and

an interconnect configured to be compatible with Personal Computer Memory Card International Association (PCMCIA) standards coupled to said electronic circuit board providing external electrical connection to said disk storage unit, said interconnect being disposed along a peripheral side of said frame.

5,488,524

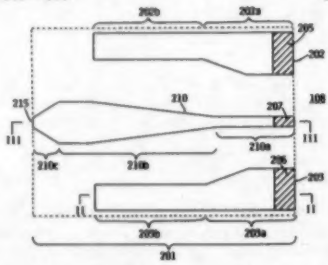
SELF ADAPTIVE HEAD FOR SEMI-CONTACT RECORDING

Earl A. Cunningham, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1993, Ser. No. 172,683

Int. Cl.[6] **G11B** *21/21;5/60*

U.S. Cl. 360—103 **13 Claims**



1. An air bearing slider assembly comprising:

a plurality of separated elongated rails, each rail extending in a direction parallel to a longitudinal axis of the slider assembly, each rail having a leading edge at an air inflow end of the slider assembly and a trailing edge, a first rail of the plurality of elongated rails having a load bearing portion between the leading edge and the trailing edge and a constricted tail portion at the trailing edge, said tail portion being narrower than said load bearing portion, a second elongated rail of the plurality of elongated rails being positioned on one side of the first rail, the trailing edge of said first rail being positioned further away from the air inflow end of the slider assembly than the trailing edge of said second rail; and

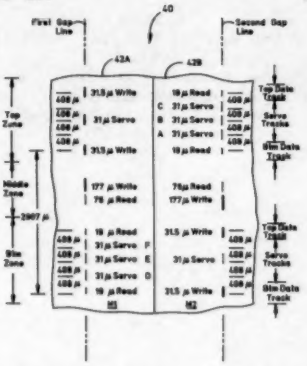
a transducer element mounted on the first rail constricted tail portion.

5,488,525

DECOUPLED MAGNETIC HEAD ASSEMBLY FOR QUARTER-INCH TAPE

George F. Adams, and Vincent N. Kahwaty, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 18, 1994, Ser. No. 292,680
Int. Cl.[6] G11B 5/265;5/48
U.S. Cl. 360—104 28 Claims



1. A head assembly which has a plurality of write elements, magnetoresistive read elements and magnetoresistive servo elements, each element having a respective gap which has a track width which is located at a head surface of the head assembly, the head assembly comprising:

the head surface having top and bottom zones, each of the top and bottom zones having a length and a lateral width;

each of the top and bottom zones including:

only first and second longitudinally spaced gap lines which extend laterally along a width of the respective zone;

the track widths of the gaps extending along the gap lines;

first and second data lines and servo lines laterally spaced from one another and capable of corresponding with tracks on a magnetic tape, the servo line being located between the first and second data lines;

the track widths of the gaps extending perpendicular to the data lines;

a first set of a write gap and a read gap located along first one of the data lines and a second set of a write gap and a read gap located along a second one of the data lines, the write gap of each of the first and second sets being located on one of the gap lines and the read gap of each of the first and second sets being located on the other gap line; and

at least one servo gap located on each of the servo lines; and

the write gaps, the read gaps and the servo gaps of the first and second zones being a mirror image with respect to one another.

5,488,526

DISK DRIVE DEVICE HAVING A SPINDLE MOTOR AND A HEAD CARRIAGE SECTION BOTH PROVIDED IN A DISK CASSETTE LOADING AREA

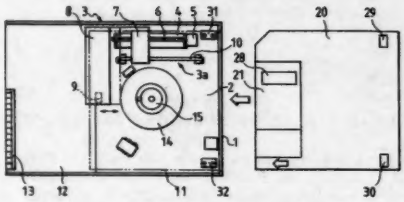
Hiroshi Sakashita, and Eiji Arasaki, both of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Tokyo, Japan

Filed Apr. 1, 1994, Ser. No. 221,786
Claims priority, application Japan, Apr. 1, 1993, 5-098626
Int. Cl.[6] G11B 5/55
U.S. Cl. 360—106 10 Claims

1. A disk driving device comprising:

a chassis;

a substrate disposed in a disk cassette loading area of said chassis;



a spindle motor including a hub base for mounting a disk cassette; and

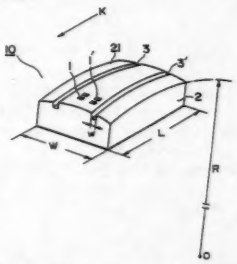
a head carriage mechanism including a head for recording and reproducing information from the disk cassette, said spindle motor and said head carriage mechanism both being mounted on said substrate disposed in the disk cassette loading area of said chassis, wherein said loading area comprises only the area above the substrate which conforms to the area bounded by the projection of the cassette onto the substrate, said head carriage mechanism comprises a guide mechanism extending in parallel with a cassette insertion direction so as to move the head in a direction parallel with the cassette insertion direction, said guide mechanism being disposed on a side of said spindle motor when viewed in the cassette insertion direction, said guide mechanism being disposed between the disk cassette and said substrate when viewed in the cassette insertion direction.

5,488,527

MAGNETIC HEAD INCLUDING A MAGNETIC RECORDING MEDIUM SLIDE SURFACE WITH PREDETERMINED DIMENSIONS

Noboru Komori; Yoshiaki Kato, and Masaru Umekida, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 728,499, Jul. 11, 1991, abandoned.
This application Feb. 4, 1994, Ser. No. 191,729
Claims priority, application Japan, Jul. 20, 1990, 2-190629
Int. Cl.[6] G11B 5/60;5/147
U.S. Cl. 360—122 10 Claims



1. A thin film magnetic head comprising a floating head slider having a spherical surface, a portion of which constitutes a medium facing surface, wherein

a radius R of said spherical surface is in a range of 80 mm≦R≦100 mm,

said facing surface, as viewed from a magnetic recording medium opposing said facing surface, is in the shape of a rectangle having an overall length L along the air flow of 1.3 to 3 mm and a transverse width W in a direction normal to the air flow of 1 to 2.2 mm, and wherein

at least two longitudinal grooves, each having a width w in a range of 100 μm≦w≦500 μm, are formed on said facing surface extending along said air flow,

wherein the grooves have a depth of 20 to 150 μm,

wherein at least one transducer element is disposed in the spherical surface at the effluent side of air flow, and

wherein said head has an improved modulation waveform indexed by a relative index value of at least 0.8.

5,488,528

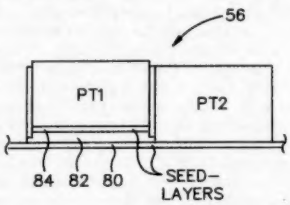
POLE TIP STRUCTURE FOR THIN FILM MAGNETIC HEADS

Mao-Min Chen; Kochan Ju, both of San Jose; Neil L. Robertson, Campbell, and Po-Kang Wang, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 175,886, Dec. 30, 1993, Pat. No. 5,393,376. This application Aug. 18, 1994, Ser. No. 292,630

Int. Cl.[6] G11B *5/147*

U.S. Cl. 360—126 **15 Claims**



1. A thin film magnetic head which has a track width comprising:

first and second pole tips PT1 and PT2;

a sidegap sandwiched between the first and second pole tips PT1 and PT2;

first and second seedlayers with an insulation layer sandwiched directly between the first seedlayer and a portion of the second seedlayer;

the first pole tip PT1 laying directly on the second seedlayer;

the second pole tip PT2 laying directly on the first seedlayer; and

each of the pole tips PT1 and PT2 being offset from one another along said track width by thicknesses of the insulation layer and the second seedlayer to form an air bearing surface which is substantially perpendicular to the sidegap, the first and second seedlayers and the insulation layer.

5,488,529

METHOD FOR PREVENTING DEPOSITION ON MAGNETIC HEAD, AND PHOTOGRAPHIC FILM

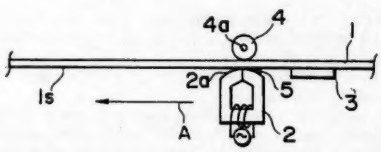
Yoshiaki Kato, Minamiashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 12, 1993, Ser. No. 16,906

Claims priority, application Japan, Feb. 14, 1992, 4-59157

Int. Cl.[6] G11B *5/41;15/60*

U.S. Cl. 360—128 **9 Claims**



1. A method for preventing deposition on a magnetic head during information recording and/or reproducing on or from a photographic film wherein at least one magnetic track is provided along a longitudinal direction of said photographic film, and wherein information recording and/or reproduction is executed by running said magnetic track on a surface of the magnetic head, comprising running a step difference of a photographic film base provided on said magnetic track or an extension of said magnetic track over a width being at least equal to or greater than that of said magnetic track and disposed outside an image area of the photographic film in contact with said surface of the magnetic head.

5,488,530

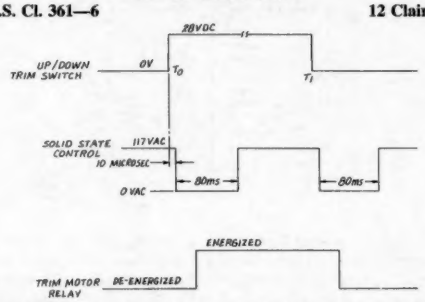
SYSTEM AND METHOD FOR PROTECTING RELAY CONTACTS

Hans E. De Jong, Rossmoor, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Apr. 22, 1993, Ser. No. 50,602

Int. Cl.[6] H02H *3/033*

U.S. Cl. 361—6 **12 Claims**



1. A system for protecting electromagnetic relay contacts from erosion, comprising:

an A.C. load power source:

a load:

a relay for electrically connecting said load power source and said load:

a housekeeping power source;

a switch disposed in a D.C. circuit for energizing or deenergizing said relay, the circuit electrically connecting said switch and said relay;

means for sensing D.C. voltage change across said switch, said means being connected to said housekeeping power source;

a solid state component electrically connected in series between said load power source and said load, and also electrically connected in series with said sensing means;

a time delay means connected in series between the sensing means and the solid state component, said delay means further being connected to said housekeeping power source and being responsive to the sensing means for delaying A.C. current flow between the load power source and the load for a period of time selected to allow generally full closure or opening of the contacts.

5,488,531

REDUNDANT POWER MIXING ELEMENT WITH FAULT DETECTION FOR DC-TO-DC CONVERTER

David L. Aldridge, Dripping Springs; Stephen R. Bissell, and Daniel D. Gunn, both of Austin, all of Tex., assignors to Tandem Computers Incorporated, Cupertino, Calif.

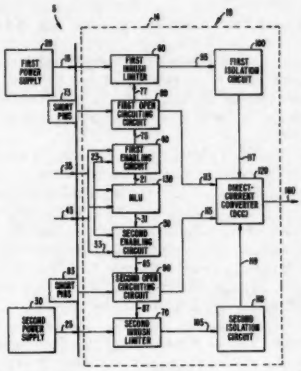
Filed Jun. 30, 1994, Ser. No. 268,918

Int. Cl.[6] H02J *1/04;* **H02H** *7/10*

U.S. Cl. 361—18 **21 Claims**

1. A power mixing apparatus coupled to receive first and second power rails to produce therefrom a direct current output, the power mixing apparatus comprising:

connection means for removably coupling the power mixing apparatus to the first and second power rails, the connection means including open circuiting pins for completing a circuit path when the power mixing apparatus is coupled to the first and second power rails;



means for producing an enabling signal coupled to the open circuiting pins;

a pair of current limiters each respectively coupled to receive corresponding ones of the first and second power rails and to the open circuiting pins to receive the enabling signal to produce first and second currents from a one and another one of the pair of power rails, respectively, when the circuit path is complete; and

a converter coupled to receive the first and second currents for producing the direct-current output.

5,488,532

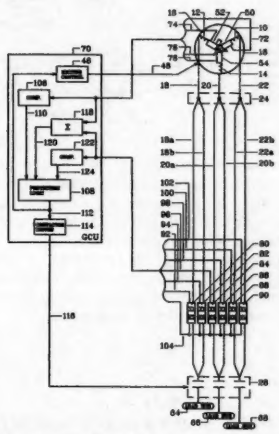
SYSTEM OF PROTECTION FOR ELECTRIC POWER DISTRIBUTION FAILURES

David J. Mrowiec, Rockford, Ill., and Jef W. Good, Beloit, Wis., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 27, 1993, Ser. No. 144,071

Int. Cl.[6] H02H *3/00*

U.S. Cl. 361—63 **29 Claims**



1. A system of protection for an electric power distribution system having at least three phases and at least two parallel power feeders per phase coupling a source of electrical energy through a contactor device to a lead distribution bus, comprising:

a controller;

an individual parallel feeder current sensor associated with each individual parallel power feeder sensing electrical current conducted therein, said parallel feeder current sensors producing output parallel current sense signals proportional to the magnitude of the parallel feeder current sensed thereby;

means coupling said parallel feeder current sensors to said controller for conducting said output parallel current sense signals thereto; and wherein

said controller comprises

a comparator having an input coupled to said parallel feeder current sensors by said coupling means and an output, said comparator comparing the magnitudes of said output parallel current sense signals per phase, said comparator further generating a magnitude differential signal per phase, and

protection logic circuitry, coupled to said output of said comparator, processing said magnitude differential signals, said protection logic circuitry generating a first output protection signal when any of said magnitude differential signals exceeds a predetermined threshold for a predetermined amount of time sufficient to indicate a high impedance fault on at least one of the parallel power feeders.

5,488,533

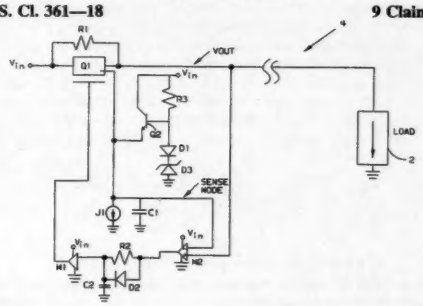
METHODS AND APPARATUS FOR ISOLATING A POWER NETWORK FROM A LOAD DURING AN OVERCURRENT CONDITION

Bruce M. Cassidy, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 7, 1994, Ser. No. 192,921

Int. Cl.[6] H02H *3/20*

U.S. Cl. 361—18 **9 Claims**



1. An electrical circuit for controlling current from a power source to a load, said circuit comprising:

transistor means, having a load current path coupled between the power source and the load, for supplying load current, and having a sense current path coupled to said power supply, for supplying sense current proportional to but substantially less than said load current, and wherein a load voltage decreases as the load current increases due to increasing voltage drop across said load current path;

bias means for preventing an output of said sense current path from falling below a predetermined voltage;

a current sink coupled to said sense current path output; and

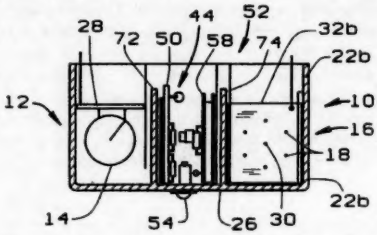
a comparator having a first input coupled to said sense current path output, a second input coupled to said load and an output coupled to activate said transistor means when said load voltage is greater than a voltage of said sense current path output and deactivate said transistor means when said load voltage is less than the voltage of said sense current path output.

5,488,534

TRANSIENT VOLTAGE SURGE SUPPRESSION MODULE WITH ULTRAFAST FUSING

C. Peter Rau, Tioga County, N.Y., and Thomas T. Hitch, Mercer County, N.J., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 19, 1993, Ser. No. 109,815
Int. Cl.[6] H02H *9/04*
U.S. Cl. 361—56 **20 Claims**



1. Transient voltage surge suppressor (TVSS) apparatus for connection to a power line to protect equipment connected to the line from damage in the event of high voltage surges or transients comprising:

semiconductor means connected to the power line, said semiconductor means being normally non-conducting when normal line voltage is supplied thereto, but being switched into conduction by the voltage provided thereto when an overvoltage condition caused by a line surge occurs;

fuse means connected to the semiconductor means to protect the semiconductor means in the event of an excessive current spike caused by a high voltage transient on the line;

module means in which said semiconductor means and said fuse means are installed; and,

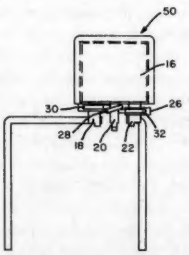
plasma suppression means substantially completely filling said module means for preventing the spread of a plasma produced if the semiconductor means or the fuse means is destroyed by the line surge or transient, said suppression means including means substantially completely encapsulating both the semiconductor means and fuse means within said module means so plasma produced if either the semiconductor means or fuse means fails is quickly extinguished and thus cannot spread to other components.

5,488,535

ARC SUPPRESSOR FOR SIDACTORS

Mohammad Masghati, Addison, and Jack R. Cline, Bartlett, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Continuation-in-part of Ser. No. 188,509, Jan. 26, 1994, Pat. No. 5,424,901. This application Apr. 7, 1995, Ser. No. 418,276
Int. Cl.[6] H02H *9/04*
U.S. Cl. 361—119 **20 Claims**



1. An arc suppressor for a sidactor fail-safe device used for protecting telecommunication equipment against high voltage surges, comprising:

a sidactor comprising a substantially rectangularly-shaped body member, first and second end terminal pins, and a central terminal pin;

a fail-safe mechanism mounted upon and engaged with said first and second end terminal pins and said central terminal pin for short-circuiting at least one of said first and second end terminal pins to said central terminal pin under overload conditions; and

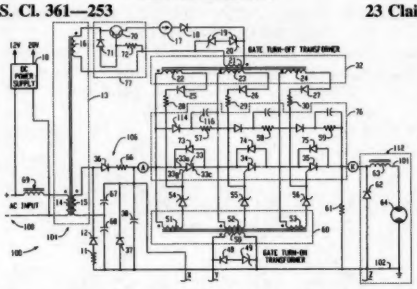
a housing tightly enveloping said substantially rectangularly-shaped body member of said sidactor so as to increase the strength of said substantially rectangularly-shaped body member of said sidactor and thereby preserve the structural integrity of said substantially rectangularly-shaped body member of said sidactor by preventing the development of cracks within said substantially rectangularly-shaped body member under said overload conditions such that any plasma gas, generated within said substantially rectangularly-shaped body member of said sidactor under said overload conditions, is contained within said substantially rectangularly-shaped body member of said sidactor and not permitted to escape from said substantially rectangularly-shaped body member of said sidactor so as not to develop an environment within which arcing between said end and central terminal pins of said sidactor can occur.

5,488,536

EXCITER CIRCUIT USING GATED SWITCHES

Howard V. Bonavia, Groton, and Dale F. Geislinger, Norwich, both of N.Y., assignors to Simmonds Precision Engine Systems, Inc., Akron, Ohio

Filed Apr. 1, 1993, Ser. No. 40,720
Int. Cl.[6] F02P *3/09*
U.S. Cl. 361—253 **23 Claims**



7. In combination with an exciter for an internal combustion engine wherein the exciter comprises a charging circuit, a discharge circuit and a storage capacitor connected to the charging circuit and an igniter plug to produce sparks: a gate controlled thyristor having an anode and cathode connected as a switch to the storage capacitor and the plug, and trigger means for applying a first gate signal to switch said thyristor on to control discharge of the capacitor, and for applying a second gate signal to switch said thyristor off to control charging of the capacitor.

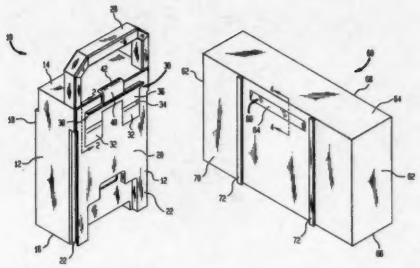
5,488,537

SAFETY INTERCONNECT LATCH FOR PORTABLE MEDICAL ELECTRONIC PATIENT MONITORING PRODUCT

Martin S. Heald, Beverly, and Per O. Hoel, Magnolia, both of Mass., assignors to Siemens Medical Systems, Inc., Iselin, N.J.

Filed Mar. 28, 1994, Ser. No. 218,394
Int. Cl.[6] H05K *7/10;7/11*
U.S. Cl. 361—684 **18 Claims**

1. A portable carrier for receiving a portable product having a recess forming a notch extending from an edge of the recess, the



portable product further having a track on one of a the plurality of external surfaces, the portable carrier comprising:

(a) a housing having a plurality of outer walls;

(b) a rail on one of the plurality of outer walls for engaging the track on the portable product and for aligning the portable product to the portable carrier;

(c) a latch assembly for insertion into the recess in the portable product, comprising:

(1) a shoulder portion adapted to fit into the recess of the portable product;

(2) a locking lip portion extending from the shoulder for engaging the notch of the portable product;

(3) a flexible member portion connected at one end to the shoulder and secured at another end to one of the plurality of outer walls and that allows the locking lip to move from a first position external to the recess to an intermediate position within the recess;

wherein when (A) the rail on one of the plurality of outer walls engages the track on the portable product so as to align the portable product to the portable carrier and (B) the locking lip is in the intermediate position within the recess and (C) the portable carrier is elevated relative to the portable product, the locking lip is caused to move to a locked position within the recess where the locking lip and notch are lockingly engaged to lock the portable carrier to the portable product.

5,488,538

MOUNTING STRUCTURE FOR MAGNETIC DISK DRIVE

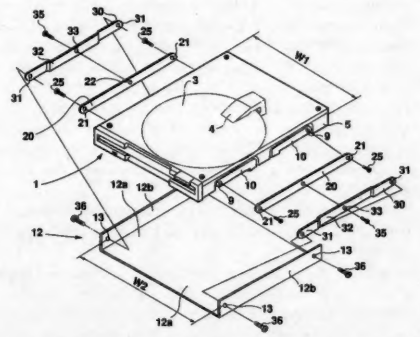
Maki Wakita, Sayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1994, Ser. No. 202,000

Claims priority, application Japan, Mar. 12, 1993, 5-016522 U; Mar. 12, 1993, 5-016523 U

Int. Cl.[6] G06F *1/16;* **G11B** *33/02;* **H05K** *7/02*

U.S. Cl. 361—685 **10 Claims**



1. A system for mounting a magnetic disk drive onto an electronic equipment body having mounting holes, said system comprising:

a magnetic disk drive body having at each lateral sidewall a couple of threaded holes;

a first spacer arranged adjacent each sidewall of said magnetic disk drive body and having a single threaded through-hole and a couple of throughholes at positions immediately confronting said couple of threaded holes provided on each lateral sidewall of said magnetic disk drive body; and

a second spacer adjacent said first spacer, said second spacer having a single through-hole at a position immediately confronting said single threaded-hole of said first spacer, said second spacer having a couple of threaded holes at positions immediately confronting mounting holes on said electronic equipment body;

wherein, when said electronic equipment body has the same lateral dimensions as said magnetic disk drive, said magnetic disk drive is mounted onto said electronic equipment body by directly screwing bolts or machine screws into threaded holes of mounting members, and where said electronic equipment body has larger lateral dimensions than said magnetic disk drive, the attachment to said electronic equipment body being effected by way of said first and second spacers.

5,488,539

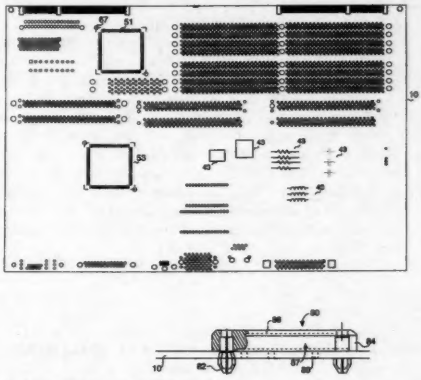
PROTECTING COT PACKAGED ICS DURING WAVE SOLDER OPERATIONS

James F. Testa, Mountain View; Jens Horstmann, Sunnyvale, and Hassan Siahpolo, Campbell, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Jan. 21, 1994, Ser. No. 184,015

Int. Cl.[6] H05K *7/20*

U.S. Cl. 361—720 **11 Claims**



1. An apparatus comprising:

a printed circuit board having a first surface, a second surface, and a plurality of through holes;

a solder pad for supporting a chip on tape packaged integrated circuit, the solder pad being formed on the first surface of the printed circuit board wherein said solder pad includes a multiplicity of fine metallic traces spaced closely together such that said traces are used to electrically connect said printed circuit board to said chip on tape packaged circuit;

a plurality of through hole mounted components which are mounted on the second surface of the printed circuit board and which include pins extending through said through holes such that a wave solder operation at the first surface of the printed circuit board secures said components to the printed circuit board; and

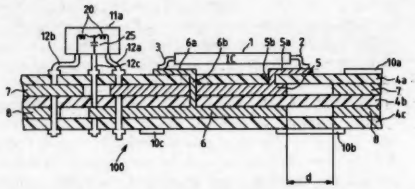
a pad cover mounted over the solder pad in a manner that protects the solder pad from being exposed to solder during said wave solder operation thereby preventing damage to the metallic traces of the solder pad.

5,488,540

PRINTED CIRCUIT BOARD FOR REDUCING NOISE

Hironobu Hatta, Okazaki, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 18, 1994, Ser. No. 178,183
Claims priority, application Japan, Jan. 19, 1993, 5-006627
Int. Cl.[6] H05K *1/11;7/06;* **H03H** *7/00*
U.S. Cl. 361—794 **17 Claims**



1. A printed circuit board adapted for connection with an IC via a plurality of IC mounting terminals including at least an IC power terminal and an IC ground terminal, said printed circuit board comprising:

an IC mounting area over which an IC can be mounted;

first and second mounting conductors adapted to be connected with the IC power terminal and IC ground terminal, respectively;

first and second conductive pattern blocks formed at locations overlapping the IC mounting area, said first and second conductive pattern blocks being connected with said first and second mounting conductors, respectively;

a first common conductor for electrical connection with the IC power terminal through said first conductive pattern block and said first mounting conductor;

a second common conductor for electrical connection with the IC ground terminal through said second conductive pattern block and said second mounting conductor;

a first noise-reducing element electrically connecting said first conductive pattern block and said first common conductor to reduce noise transmitted from said first conductive pattern block to said first common conductor;

a second noise-reducing element electrically connecting said second conductive pattern block and said second common conductor to reduce noise transmitted from said second conductive pattern block to said second common conductor; and

a first insulating base layer for insulating said first common conductor from said second common conductor and said first conductive pattern block from said second conductive pattern block.

5,488,541

VME BUS COMPATIBLE BACKPLANE AND SHELF ARRANGEMENT

Balwantrai Mistry, Nepean, and Raymond B. Wallace, Kanata, both of, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 1, 1994, Ser. No. 251,994
Int. Cl.[6] H01R *23/68;* **H05K** *7/14*
U.S. Cl. 361—788 **4 Claims**

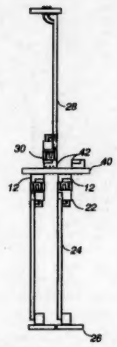
1. A VMEbus compatible backplane arrangement comprising:

a printed circuit board having first and second faces and first and second busses;

a plurality of first connectors disposed upon the first face, distributed along the backplane at a substantially fixed interval spacing and connected to the first bus;

a plurality of second connectors disposed upon the first face, distributed along the backplane at substantially the same spacing as that of the first connectors, and connected to the second bus, each corresponding located pair of the first and second connectors being suitably aligned across the backplane for receiving a respective VMEbus circuit card:

a plurality of third connectors mounted on the second face for directly receiving respective VMEbus transition cards, and



each third connector being mounted at a location laterally intermediate a pair of second connectors; and

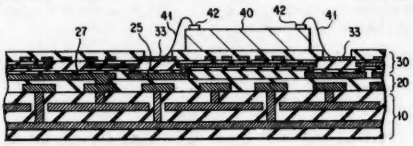
each second connector having a first plurality of terminals connected to the second bus, and a second plurality of terminals connected to a selected third connector.

5,488,542

MCM MANUFACTURED BY USING THIN FILM MULTILEVEL INTERCONNECTION TECHNIQUE

Kenji Ito, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 17, 1994, Ser. No. 291,859
Claims priority, application Japan, Aug. 18, 1993, 5-203808
Int. Cl.[6] H05K *1/11*
U.S. Cl. 361—793 **16 Claims**



1. A semiconductor device comprising:

a ceramic base substrate;

a thick film wiring portion formed on the ceramic base substrate and including a thick film wiring layer and a thick film insulating layer;

a thin film multilayered wiring portion formed on the thick film wiring portion and including a first region in which thin film wiring layers and thin film insulating layers are alternately stacked upon each other, and a second region in which a plurality of thin film insulating layers are stacked upon one another, at least one of the thin film wiring layers of the first region of the thin film multilayer wiring portion being electrically connected to at least one of the thin film wiring layers of the thin film multilayered wiring portion by way of a part of the thick film wiring layers located under the second region;

a semiconductor chip mounted on the first region of the thin film multilayered wiring portion and and having a plurality of first bonding pads;

a plurality of second bonding pads formed on the second region of the thin film multilayered wiring portion; and

a connection wiring for electrically connecting the first bonding pads to the second bonding pads, said connection wiring having one end which is pressed and coupled to the first bonding pads and another end which is pressed and coupled to the second bonding pads.

5,488,543

FRAME STAND

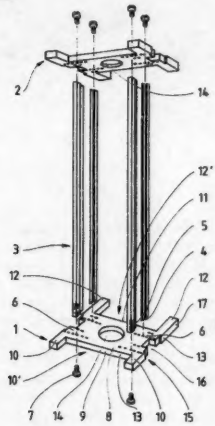
Paul Mazura, Karlsbad, and Hans-Martin Schwenk, Straubenhardt, both of, Germany, assignors to Schroff GmbH, Straubenhardt, Germany

Filed Sep. 29, 1994, Ser. No. 310,794

Claims priority, application Germany, Jan. 6, 1993, 43 33 947.6; Apr. 2, 1994, 94 05 618 U

Int. Cl.[6] H02B *1/01*

U.S. Cl. 361—829 **14 Claims**



1. A frame stand for a device cabinet serving in the installation of component carriers of industrial electronics, and which is provided with panels, comprising: a lower base plate; an upper lid plate; parallel posts of equal length extending between the base plate and lid plate, the end faces on both sides of the posts have fastening bores; said base plate and lid plate having groups of fastening holes; said base plate and lid plate being fixedly connected to the posts by fastening screws which pass through the fastening holes and extend into the fastening bores; said base plate and lid plate being essentially formed by a fastening plate which has a rectangular base outline and groups of fastening holes; two front brackets that form a front recess between themselves and projecting at a right angle to the one longitudinal side of the base plate and the lid plate; two rear brackets arranged on the opposite longitudinal side of the base plate and lid plate, said rear brackets forming a rear recess between themselves and projecting at a right angle; said front and rear brackets being formed onto the ends of the longitudinal sides; and, one front and one rear bracket are aligned respectively with one another.

5,488,544

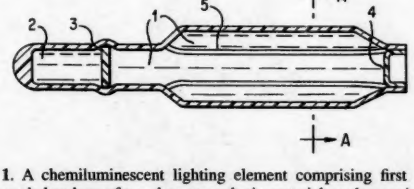
CHEMILUMINESCENT LIGHTING ELEMENT

Jacques Ladyjensky, Brussels, Belgium, assignor to Omniglow Corporation, Novato, Calif.

Filed Aug. 26, 1991, Ser. No. 750,152

Int. Cl.[6] F21K *2/00*

U.S. Cl. 362—34 **4 Claims**



1. A chemiluminescent lighting element comprising first and second chambers of translucent synthetic material, each containing at least one chemical product which reacts with the other to produce a chemiluminescent reaction, said chambers being separated by a moveable tightness means which yields, moves or rotates under the action of the same coincident increase in the external pressure on the two chambers to permit mixing of the two chemical products and result in the production of light and wherein the first chamber has walls such that the coincident exertion of said same external pressure on the element causes more of a reduction in the volume of said first chamber than in that of the second chamber.

5,488,545

LIGHTING FIXTURE CONTROL APPARATUS FOR VEHICLE

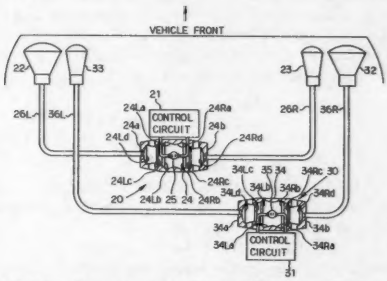
Hideyuki Kato, Nishio; Ryoichi Sugawara, Nagoya; Yasutoshi Horii, Toyoake, and Hiromi Hiramatsu, Anjo, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 28, 1994, Ser. No. 266,742

Claims priority, application Japan, Jun. 30, 1993, 5-161037; Apr. 28, 1994, 6-090925

Int. Cl.[6] F21V *8/00*

U.S. Cl. 362—32 **12 Claims**



1. A lighting fixture apparatus for a vehicle comprising:

a pair of optical transmission devices for emitting light from the vehicle toward a front circumference of the vehicle;

each of said optical transmission devices being provided with a single light source, two light emitting portions wherein either one of said two light emitting portions is arranged at a left side of the vehicle and the other one of said two light emitting portions is arranged at a right side of the vehicle, and optical fibers for propagating light from said single light source to said two light emitting portions; and

said two light emitting portions of each of said optical transmission devices having respectively different light emitting functions which are combined to provide a predetermined lighting function at each of said right and said left sides of said vehicle.

5,488,546

COLOR-CHANGING LAMP FOR VEHICLE

Osamu Sato; Toshihisa Hayami; Hideki Ohashi; Makoto Izawa; Tomoaki Serizawa, and Hideki Uchida, all of Shimizu, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Nov. 14, 1994, Ser. No. 337,854

Claims priority, application Japan, Nov. 22, 1993, 5-315937

Int. Cl.[6] F21M *3/25*

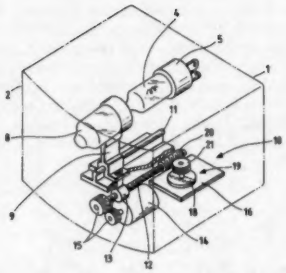
U.S. Cl. 362—61 **18 Claims**

1. A color-changing lamp comprising:

a bulb for emitting a first color of light;

a power source for energizing said bulb;

a glove formed of a light-transmissive material having a second color, said glove being disposed on an optical axis of said bulb;



a change-over switch for changing a position of said glove between a first position where said glove covers said bulb and a second position where said glove is in an exposure position for said bulb;

means for moving said glove between said first position and said second position, said glove moving means being operated in accordance with said change-over switch;

means for controlling a power supplying from said power source to said bulb, said power controlling means operatively engaging with said glove moving means and turning on said bulb when said glove is located at one of said first and second positions and turning off said bulb while said glove is moving between said first and second positions.

5,488,547

HEADLAMP FOR A MOTOR VEHICLE

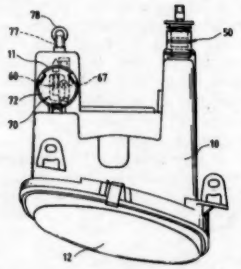
Tatushi Hiraoka, Shizuoka, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1994, Ser. No. 252,194

Claims priority, application Japan, Jun. 2, 1993, 5-131761

Int. Cl.[6] B60Q *1/04*

U.S. Cl. 362—66 **11 Claims**



1. A headlamp for a motor vehicle comprising:

a main body having a front opening and a rear expanded portion;

a front lens attached to said front opening of said main body for defining a lamp chamber;

a reflector structure housed within said lamp chamber and supported to be tiltable with respect to said body, said reflector structure comprising a wall with a front-facing reflective surface and a rear facing surface; and

a bubble tube type level device enclosed by said rear expanded portion for detecting a vertical inclination of said reflector, said level device being affixed on said reflector structure and being disposed substantially horizontally in a longitudinal direction of the motor vehicle, said level device extending rearward from said rear facing surface of said reflector, wherein said rear expanded portion of said lamp body forms therein an air hole allowing air to flow to and from the lamp chamber.

5,488,548

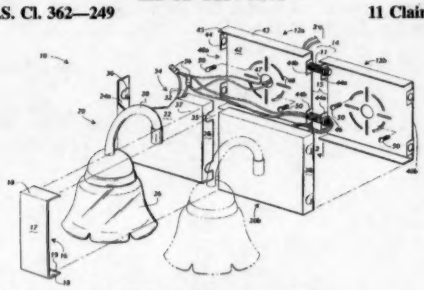
MODULAR LIGHTING FIXTURE

Allan H. C. Kwong, 11 Wang Chiu Road, Kowloon Bay, Kowloon, Hong Kong

Filed Dec. 3, 1993, Ser. No. 161,914

Int. Cl.[6] F21V *21/02*

U.S. Cl. 362—249 **11 Claims**



1. A modular wall lighting fixture, comprising:

at least two lighting fixture modules, each module comprising:

a faceplate having a face with at least two opposing flanges extending laterally from the edge of the face, each of the two opposing flanges including a knockout for selective removal to form an opening for receiving electrical conductors therethrough;

means for receiving a light bulb that connects with a pair of electrical conductors to a supply of electricity;

said modular wall lighting fixture further comprising means for securing the fixture modules to a surface in a spaced-apart relationship such that at least one pair of adjacent ones of the fixture modules is provided which defines a gap therebetween, with the pair of electrical conductors from a first of the pair of fixture modules extending into a second of the pair of fixture modules through an adjacent pair of openings defined by removing the facing ones of the knockouts in the flanges of the pair of fixture modules; and

a cap that covers a gap between the faces of the pair of fixture modules for hiding the pair of electrical conductors extending between the pair of fixture modules.

5,488,549

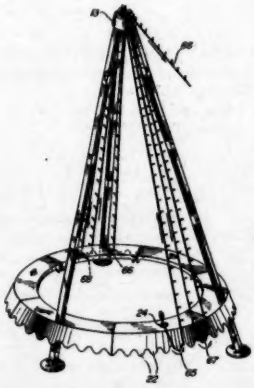
DECORATIVE LIGHT-SUPPORTING APPARATUS FOR HOLDING CONNECTED STRINGS OF LIGHTS

Donna R. Miller, and Kenneth B. Miller, both of 7011 E. Avenida de Santiago, Anaheim Hills, Calif. 92807

Filed Oct. 19, 1994, Ser. No. 325,576

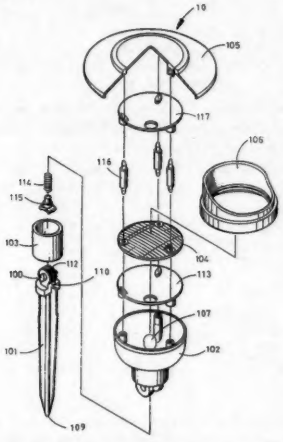
Int. Cl.[6] F21P *1/00*

U.S. Cl. 362—252 **30 Claims**



1. A decorative light-supporting apparatus, comprising:
lower light-routing means having protrusions that extend at least partially downwardly therefrom for contacting and routing a connected string of lights behind said protrusions at a first plurality of locations on the connected string of lights;
extending means for extending above the lower light-routing means; and
upper light-routing means connected to the extending means for contacting and routing the connected string of lights at a second plurality of locations cn the connected string of lights, the connected string of lights contacting and folding over a portion of the upper light-routing means at each of the second plurality of locations;
whereby the connected string of lights is wound a plurality of times between the upper light-routing means and behind the protrusions to form an approximate shape of a Christmas tree, each winding routing the string of lights from behind a protrusion up to the upper light-routing means and back down to and behind another protrusion.

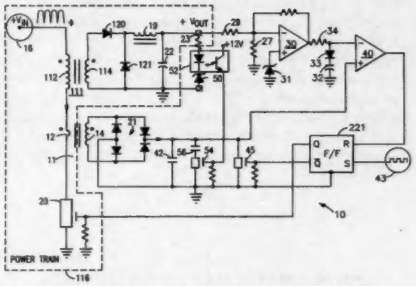
5,488,550
MULTI PURPOSE LAMP
Jerry S. C. Yang, 8F-8, No. 20, Ta Lung Road, Taichung, Taiwan, Prov. of China
Division of Ser. No. 978,325, Nov. 18, 1992, Pat. No. 5,384,694. This application Oct. 25, 1994, Ser. No. 328,494
Int. Cl.[6] F21V *7/00*
U.S. Cl. 362—298 **1 Claim**



1. A multi-purpose lamp for outdoor use, comprising a pole for insertion into the ground, a support mounted on the pole, a bulb within the support and substantially enclosed therein, a lens mounted on the support above the bulb, a convex-concave parabolic reflector mounted within the support and disposed below the bulb, and first and second shades mounted on the support and spaced therefrom above the lens.

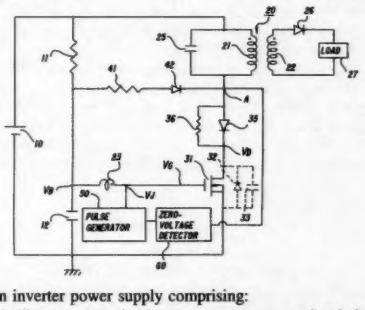
5,488,551
PULSE WIDTH MODULATED POWER SUPPLY WHICH AVOIDS EXCESSIVE ON-TIME OF SWITCH DURING START-UP
Randhir S. Malik, So. Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 27, 1993, Ser. No. 143,818
Int. Cl.[6] H02M *3/335*
U.S. Cl. 363—20 **15 Claims**

1. A pulse width modulated power supply comprising:



an input transformer having a primary winding, a secondary winding and means for coupling the primary winding to a DC power supply;
a switch coupled to the primary winding to control power through the primary winding;
a rectifier connected across the secondary winding to rectify current induced in the secondary winding;
an output capacitor coupled to the rectifier to develop a DC output voltage; and
means for controlling said switch based on a first, relatively short RC time constant during start up such that widths of pulses through said primary winding are relatively short and controlling said switch based on a second, relatively long RC time constant afterwards such that widths of pulses through said primary winding are relatively long.

5,488,552
INVERTER POWER SUPPLY
Hiroshi Sakamoto, 6-388-3, Tsuboi, Kumamoto-shi, Kumamoto; Hideki Tamura, Moriyama, and Kaoru Furukawa, Hikone, all of, Japan, assignors to Hiroshi Sakamoto, Kumamoto, and Matsushita Electric Works, Osaka, both of, Japan
Filed Oct. 6, 1993, Ser. No. 132,454
Claims priority, application Japan, Jan. 7, 1992, 4-268909; Jun. 25, 1993, 5-154864
Int. Cl.[6] H02M *3/335*
U.S. Cl. 363—21 **15 Claims**



1. An inverter power supply comprising:
a switching transistor having a gate, a source, and a drain;
a transformer having a primary winding and a feedback winding, said primary winding being connected in series with said switching transistor and a capacitor connected in parallel with said primary winding to form a resonant circuit, and said feedback winding being connected in series with said gate of said switching transistor;
a starter circuit for starting said resonant circuit;
a bias voltage generating circuit connected to apply a bias through said feedback winding to said gate which is a control terminal of said switching transistor;

a level detector connected at one end to said transformer, which issues a zero voltage signal when a voltage at said transformer is detected to have dropped to a level of zero or lower; and

a pulse generator connected to receive said zero voltage signal from said level detector for producing as an output a pulse of predetermined pulse-width in response to said zero voltage signal, said output of said pulse generator being connected to said gate of said switching transistor to cause said switching transistor to turn on for an ON-period determined by said pulse-width.

5,488,553

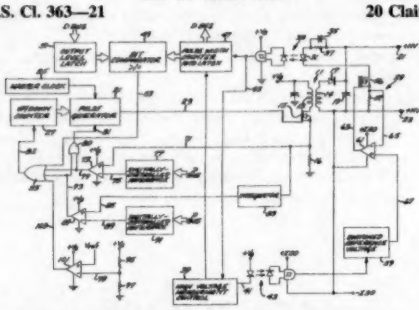
POWER CONVERTER APPARATUS FOR DEFIBRILLATING CARDIAC PACEMAKER

Herman L. Renger, Calabasas, Calif., assignor to Pacesetter, Inc., Sylmar, Calif.

Filed Dec. 15, 1993, Ser. No. 168,735

Int. Cl.[6] A61N *1/00*

U.S. Cl. 363—21 **20 Claims**



1. Power converter apparatus for receiving a relatively low dc input voltage and producing a relatively high dc output voltage, comprising:

a transformer having a primary winding and a secondary winding;

a rectifier connected to the secondary winding of the transformer and including a capacitor that carries the dc output voltage;

a first pulse-width modulator for cyclically applying the input voltage to the primary winding of the transformer, each cyclic application being for a controllably-selected time duration, whereupon an electrical current is induced cyclically in the secondary winding of the transformer, to charge the capacitor of the rectifier; and

a feedback controller that measures one or more predetermined parameters of electrical signals present in the transformer and/or rectifier, to produce one or more binary feedback signals sent to the first pulse-width modulator, to controllably adjust the time duration of a subsequent application of the input voltage to the primary winding of the transformer.

5,488,554

LOW-LOSS CLAMP CIRCUIT

Thomas W. Green, Rushford, N.Y., assignor to Acme Electric Corporation, East Aurora, N.Y.

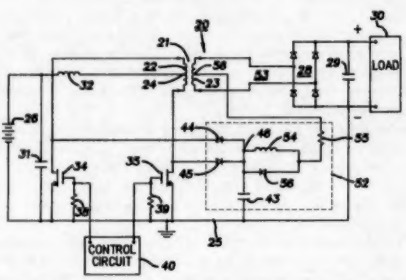
Filed Aug. 23, 1994, Ser. No. 294,440

Int. Cl.[6] H02H *7/122;* **H02M** *3/337*

U.S. Cl. 363—25 **15 Claims**

1. A low-loss clamp circuit for a DC to DC converter, the converter including a transformer with a secondary winding in a secondary circuit and center tapped primary winding, the primary winding center tap and a circuit ground being energizable by a DC voltage input, rectifier connected to the secondary winding and to the circuit ground to supply a DC output voltage;

the said rectifier being a four diode bridge rectifier, and the converter being a current fed converter;



a pair of semiconductor switches each having input and output electrodes, each end of the primary winding being connected through a respective switch to circuit ground,

each switch having a control electrode connected to a control circuit, said clamp circuit comprising:

a pair of diodes connected cathode-to-cathode across the primary winding of the switches at a clamp junction;

a clamp capacitor connected between said clamp junction and said circuit ground; and

energy return means connected to said clamp junction to return energy from said clamp capacitor directly to said secondary circuit.

5,488,555

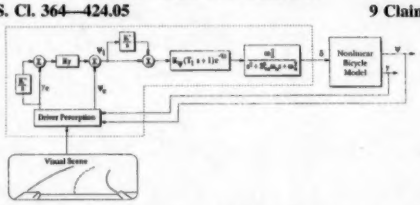
METHOD AND APPARATUS FOR FOUR WHEEL STEERING CONTROL

Jahanbakhsh Asgari; Minh N. Tran, both of Inkster, and Davorin D. Hrovat, Dearborn, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 27, 1993, Ser. No. 67,930

Int. Cl.[6] G06G *7/76;* **B62D** *5/06*

U.S. Cl. 364—424.05 **9 Claims**



5. For use with an automotive vehicle including four wheels and a four wheel steering system controlled by an electronic control unit having memory for steering the four wheels while at least one of the wheels is under a torque load, the steering system comprising:

means for determining at least one control gain for the four wheel steering system so that the torque loaded vehicle behaves like a front wheel steering vehicle under no torque load; and

means for controlling the four wheel steering system according to the control gain, thereby improving directional stability of the vehicle travelling on a slippery road surface;

the means for determining at least one control gain including means for determining a yaw rate control gain based on vehicle stability requirements,

the means for determining at least one control gain further comprising means for determining a proportional steer control gain based on the yaw rate control gain;

the means for determining a proportional steer control gain K_p determining the proportional steer control gain for a front wheel drive vehicle having a desired yaw-rate according to:

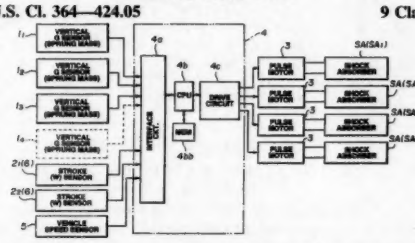
$$K_p = -\frac{uC_r(a+b)C_{f_n}}{(a+b)^2C_rC_{f_n} - (aC_{f_n} - bC_r)mu^2} K\frac{dy}{dt} - \frac{bmu^2(-C_{f_l} + C_{f_n})C_r}{C_{f_l}((a+b)^2C_rC_{f_n} - (aC_{f_n} - bC_r))mu^2}.$$

5,488,556

APPARATUS AND METHOD FOR INDEPENDENTLY CONTROLLING DAMPING FORCE CHARACTERISTIC OF VEHICULAR SHOCK ABSORBER

Mitsuo Sasaki, Atsugi, Japan, assignor to Unisia Jecs Corporation, Kanagawa, Japan

Filed Mar. 22, 1994, Ser. No. 126,040
Claims priority, application Japan, Mar. 22, 1993, 5-061942
Int. Cl.[6] B60G 17/00
U.S. Cl. 364—424.05 **9 Claims**



1. An apparatus for controlling damping force characteristics of vehicular shock absorbers independently of one another, comprising:

a) damping force characteristic changing means for changing damping force coefficients representing the respective damping force characteristics of the respective shock absorbers variably selectable in the respective shock absorbers in response to control signals respectively input thereto;

b) sprung mass vertical velocity determining means for determining vertical velocities of a sprung mass of a vehicle adjacent respective tire wheels of the vehicle;

c) front, tire wheel relative velocity determining means for determining the relative velocities between sprung mass portions and unsprung mass portions of the vehicle, said front tire wheel relative velocity determining means being disposed on vehicular portions adjacent only front left and right tire wheels;

d) vehicle speed detecting means for detecting a vehicle speed and outputting a vehicle speed indicative signal;

e) wheel base length storing means for storing a wheel base length of the vehicle;

f) front tire wheel velocity calculating means for calculating vertical velocities of the front left and right tire wheels on the basis of the relative velocities between the sprung mass portions and unsprung mass portions of the vehicle related to the front left and right tire wheels determined by said relative velocity determining means and on the basis of the sprung mass vertical velocities determined by said sprung mass vertical velocity determining means related to the front, left, and right tire wheels;

g) rear tire wheel velocity calculating means for calculating vertical velocities of the rear left and right tire wheels from the front left and right tire wheel vertical velocities, the vehicle wheel base length, and the vehicle speed indicative signal;

h) rear tire wheel relative velocity calculating means for calculating relative velocities between the sprung mass portions and unsprung mass portions of the vehicle related to rear left and right tire wheels on the basis of the rear left and right tire wheel vertical velocities calculated by said rear tire wheel velocity calculating means and of the sprung mass vertical velocities determined by said sprung mass vertical velocity determining means related to the rear left and right tire wheels; and

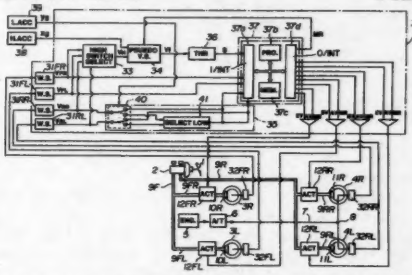
i) damping force characteristic controlling means for providing respective control signals for said damping force characteristic changing means in accordance with the determined and calculated respective relative velocities between the sprung mass portions and unsprung mass portions related to the respective tire wheels and with the determined respective sprung mass vertical velocities related to the respective tire wheels so that the respective shock absorbers provide optimum damping force characteristics.

5,488,557

ANTI-SKID CONTROLLING SYSTEM AND METHOD FOR AUTOMOTIVE VEHICLE

Toshiro Matsuda, Sagamihara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 14, 1992, Ser. No. 883,017
Claims priority, application Japan, May 16, 1991, 3-139436
Int. Cl.[6] B60T 8/62
U.S. Cl. 364—426.02 **6 Claims**



1. An anti-skid controlling system for a vehicle, comprising:

a) first sensing means for detecting rotation speeds of respective tire wheels and outputting detection signals indicative of the rotation speeds of the respective tire wheels;

b) second sensing means for detecting a lateral acceleration of a vehicular body and outputting a lateral acceleration signal indicative of the lateral acceleration;

c) third means for determining whether either one of slip rates of right and left rear tire wheels exceeds a set slip rate on the basis of the rotation speed signals for the tire wheels;

d) fourth means for operatively limiting a braking force imposed on each rear tire wheel when either one of the slip rates exceeds the set slip rate; and

e) fifth means for switching from a common anti-skid control mode in which the anti-skid control is commonly carried out for both rear tire wheels on a basis of the slip rate data derived from one of the rear tire wheels which provides a larger slip rate to an independent anti-skid control mode in which the anti-skid control is individually carried out for the respective rear tire wheels on a basis of each slip rate data derived for each one of the rear tire wheels as the lateral acceleration becomes increased, wherein said fifth means switches between the common anti-skid control mode and the independent anti-skid control mode when the lateral acceleration becomes increased and wherein the data of the left rear tire wheel speed V_{RL} is defined as $B.V_{RL}+(1-B)MIN(V_{RL}, V_{RR})$ and the data of the right rear tire wheel speed V_{RR} is defined as $B.V_{RR}+(1-B)MIN(V_{RL}, V_{RR})$, wherein B denotes a variable representing lateral acceleration y_g and $MIN(V_{RL}, V_{RR})$ denotes the rotation speed value selected from the lower of V_{RL} and V_{RR} such that the switching from the common anti-skid control for both rear tire wheels to the independent anti-skid control for each of both rear tire wheels is gradually carried out in response to the increase in the magnitude of lateral acceleration.

5,488,558

HANDY COMPUTER WITH BUILT-IN DIGITAL CAMERA AND SPOT STATE RECORDING METHOD USING THE SAME

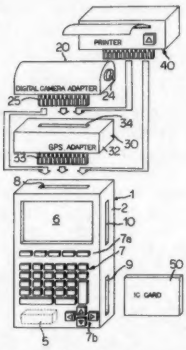
Sinji Ohki, Matsubara, Japan, assignor to Daishin Instrument Co., Ltd., Osaka, Japan

Filed Jul. 14, 1994, Ser. No. 274,753

Claims priority, application Japan, Jan. 20, 1993, 5-262078; Jan. 19, 1994, 6-003849

Int. Cl.[6] G06K *9/22*

U.S. Cl. 364—449 **6 Claims**



1. A computer with a built-in digital camera in which an image pickup unit including a charge coupled device and an imaging lens is coupled with a computer body including a portable interior power source and a bus coupling terminal for connection of a peripheral equipment, said computer comprising:

memory means for storing map information which includes a location to be inspected;

display means for selectively displaying one of said map information and an image photographed by said image pickup unit;

a microprocessor for executing internal processing of said computer body and for processing an image output signal transmitted from said image pickup unit;

input operating means for providing instructions to said computer body and for inputting data;

means for selectively calling said map information of a small area which includes said location to be inspected from said map information stored in said memory means to be inspected for graphic display;

display means for specifying and indicating said location to be inspected in said map information which is graphically displayed on said display means;

means for calculating positional data on said location from said map information specified and indicated on said display means; and

means for causing image data to be taken by said image pickup unit at an actual site corresponding to said location in said map information and for storing photographed image data transmitted from said image pickup unit in association with said positional data of said location.

5,488,559

MAP-MATCHING WITH COMPETING SENSORY POSITIONS

Leslie G. Seymour, Barrington, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

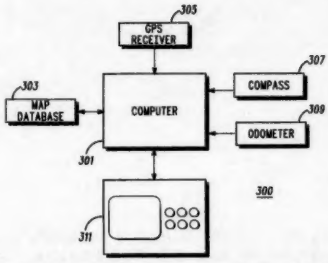
Filed Aug. 2, 1993, Ser. No. 100,804

Int. Cl.[6] G06F *15/20*

U.S. Cl. 364—449 **25 Claims**

13. A system of position estimation for determining position vectors associated with road segments on a map using competitive sensory position map-matching comprising:

first sensory means for providing a first position vector;



at least a second sensory means for providing at least a second position vector; and

means for comparing the first position vector and the at least second position vector to a road segment position vector corresponding to a road segment location determined by a reference position vector, and updating the reference position vector to correspond to a corrected position vector if at least one of the first position vector and the at least second position vector matches the road segment position vector within a predetermined criteria for a plurality of comparisons.

5,488,560

APPARATUS FOR AND METHOD OF CONTROLLING A PROCESS

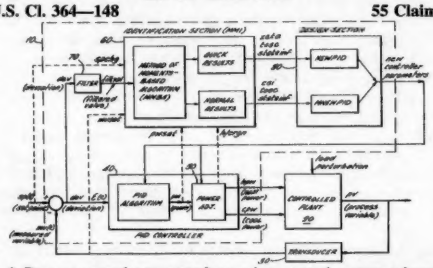
John R. Wood, Brighton, United Kingdom, and Constantin Marin, Craiova, Romania, assignors to West Instruments Limited, United Kingdom

Filed Aug. 27, 1993, Ser. No. 108,622

Claims priority, application United Kingdom, Jun. 30, 1993, 9313534

Int. Cl.[6] G05B *13/02*

U.S. Cl. 364—148 **55 Claims**



1. Process control apparatus for use in a control system, wherein said control apparatus comprises:

controller means for coupling to a process in a closed loop of said control system and for controlling a process variable having a predetermined set point value and a measured value;

first comparator means for comparing said predetermined set point value and measured value to generate a deviation signal;

said controller means being responsive to said deviation signal to control at least one operating parameter of said process to reduce said deviation signal;

identification means responsive to said deviation signal to provide a measured value of at least one characteristic of the closed loop response of the control system from said deviation signal by integrating said deviation signal with time;

second comparator means coupled to said identification means and operative to compare said at least one measured characteristic value with at least one predetermined desired characteristic value representing a desired closed loop response of the control system; and

adjustment means responsive to said second comparator means when the difference between the measured and desired characteristic values is greater than a predetermined amount, to adjust the response of said controller means such that the

closed loop response of the control systems moves towards a desired closed loop response,

wherein said identification means includes integration means to integrate said deviation signal until the deviation signal reaches a substantially steady state level comprising a noise band about a deviation signal level of zero.

5,488,561

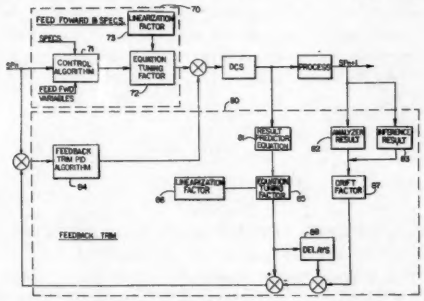
MULTIVARIABLE PROCESS CONTROL METHOD AND APPARATUS

Peter N. Berkowitz; Michael N. Papadopoulos, both of Houston; Larry W. Colwell, Friendswood, and Martin K. Moran, Houston, all of Tex., assignors to Continental Controls, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 932,155, Aug. 19, 1992, Pat. No. 5,396,416. This application Mar. 3, 1995, Ser. No. 398,598

Int. Cl.[6] G06F *19/00;* **G05B** *13/02*

U.S. Cl. 364—165 **20 Claims**



9. In a process wherein input feed having at least one fluctuating parameter is processed to yield an output feed, and wherein at least one controlled variable in the output feed varies in response to changes in the setpoint of at least one manipulated variable, a method for varying the manipulated variable setpoint to achieve an independently variable target level of the controlled variable, said method comprising the steps of:

(a) polling and collecting a plurality of process parameters affecting the controlled variable and affected by the manipulated variable;

(b) in response to the process parameters collected in step (a) and to the present value of the manipulated variable setpoint, determining the difference between said present value and an optimal value for the manipulated variable setpoint for achieving the target level of the controlled variable;

(c) in response to process parameters collected in step (a) and to the difference determined in step (b), predicting the level of the controlled variable that would result from applying said optimal manipulated setpoint value to the process;

(d) obtaining the present level of the controlled variable;

(e) comparing said predicted result from step (c) with said present level obtained in step (d) to provide a feedback signal;

(f) in response to said feedback signal and to the present value of the manipulated variable setpoint, modifying said difference determined in step (b) so that said optimal manipulated variable setpoint value more closely achieves the target level of the controlled variable; and

(g) applying a signal representing the modified optimal setpoint value derived in step (f) to control the manipulated variable setpoint in the process and thereby control the controlled variable in said output feed;

wherein steps (a) through (g) constitute an optimization cycle regularly repeated at a predetermined frequency; and

(h) in response to a command, dynamically switching during on-line operation between different process modes wherein the manipulated variable and controlled variable are different in each mode.

5,488,562

SYSTEM FOR GENERATING SIGNALS FOR CONTROL OR REGULATION OF A CHASSIS CONTROLLABLE OR REGULABLE IN ITS SEQUENCES OF MOVEMENT

Stefan Otterbein, Stuttgart; Dieter Kunz, Ditzingen-Schöckingen; Rainer Kallenbach, Waiblingen-Neustadt, and Klaus Landesfeind, Fellbach, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

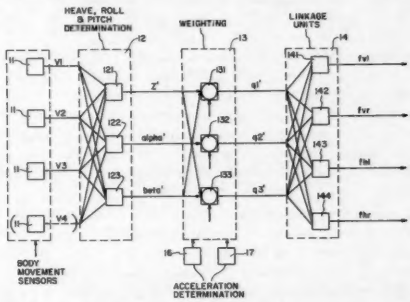
PCT No. PCT/DE92/00379, § 371 Date Jan. 27, 1993, § 102(e) Date Jan. 27, 1993, PCT Pub. No. WO92/21525, PCT Pub. Date Oct. 12, 1992

PCT Filed May 12, 1992, Ser. No. 969,840

Claims priority, application Germany, May 31, 1991, 41 17 897.1

Int. Cl.[6] B60G *17/015;11/26*

U.S. Cl. 364—424.05 **17 Claims**



1. A control system for controlling and regulating a vehicle body, said vehicle body subject to heave, pitch, and roll movements, said body connected to a plurality of wheels, a deflectable spring, and first and second adjustable suspension systems, said first and second suspension systems connected between said body and respective said wheels, said first and second suspension systems being individually independently adjustable to influence movements of said respective wheels relative to said body, said control system comprising:

means for determining a plurality of first signals which respectively represent body velocities at a plurality of preselected points of said body;

means for generating second signals based on said first signals, said second signals representing heave, roll, and pitch movements of said body;

means for generating third signals based on said second signals, said third signals representing eigenoscillation forms of said body velocities; and

means for generating actuating signals based on said third signals, for independently adjusting said first and second suspension systems.

5,488,563

METHOD AND DEVICE FOR PREVENTING COLLISIONS WITH THE GROUND FOR AN AIRCRAFT

Xavier Chazelle, Saint-Cloud; Anne-Marie Hunot, Paris, and Gérard Lepere, Aubervilliers, all of, France, assignors to Dassault Electronique, Saint Cloud, France

Filed Apr. 2, 1993, Ser. No. 41,870

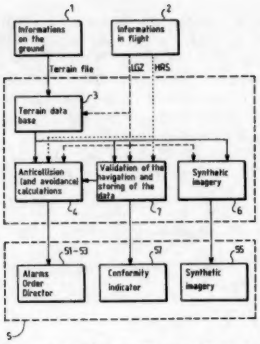
Claims priority, application France, Apr. 7, 1992, 92 04245

Int. Cl.[6] G08G *5/04*

U.S. Cl. 364—461 **26 Claims**

1. In an aerial navigation aid device, the improvement comprising:

(a) mass memory means for storing a data base representing at least a substantial part of the terrestrial globe, in a cut out form comprising a grid configuration having at least one level of resolution, said grid configuration including first grids, each first grid being associated with at least one data item representing the maximum altitude inside the first grid, and at



least one index permitting rapid access to sets of contiguous first grids contained in said data base in accordance with a system of addressing two horizontal coordinates;

(b) input means for receiving status indications representing the position of the aircraft with two horizontal components and the altitude, and the velocity and acceleration vectors of the aircraft, as well as control indications coming from the flight deck;

(c) a fast access working memory;

(d) management means for managing the data base, for extracting from and transferring into said fast access working memory a temporary local map in accordance with said horizontal components of the position of the aircraft, on the basis of which map there is defined an altitude envelope of the terrain in the zone wherein the aircraft is travelling; and

(e) anticollision processing means:

for processing said status indications so as to establish a plurality of predicted points of the flight path of the aircraft;

for comparing, at each said predicted point, the contour of a protection field round the aircraft with an altitude envelope in the corresponding part of said local map; and

for establishing an alarm if the relation between the protection field and the altitude envelope meets a first condition which is defined at least partly by said control indications.

5,488,564

NUMERICAL CONTROL UNIT WITH SCHEDULE SKIP CAPABILITY

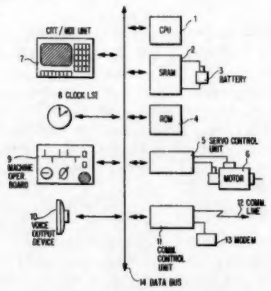
Mutsumi Ikeda, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 16, 1992, Ser. No. 899,329

Claims priority, application Japan, Jun. 17, 1991, 3-144636

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—474.16 **21 Claims**



1. A numerical control unit for performing numerical control processing in accordance with a schedule run defined by a machining command program, and for driving a machine tool according to the results of such processing for machining workpieces as commanded, comprising:

a memory for storing first and second types of machining schedules, in sequential order, each of said machining schedules comprising data identifying the machining schedule next in sequence, said first type of machining schedule including control data which is accessed by said machining command program to control driving of the machine tool, said second type of machining schedule including data which identifies one of said first type of machining schedules including said control data and which, when accessed by said machining command program, instructs said machining command program to access said control data in said one of said first type of machining schedules to control said machine tool instead of instructing said machining command program to access data in said second type of machining schedule to control said machine tool,

means for indicating whether a skip condition has occurred, and

means for causing said machining command program to access a specified machining schedule in said sequence of machining schedules when said indicating means indicates that a skip condition has occurred.

5,488,565

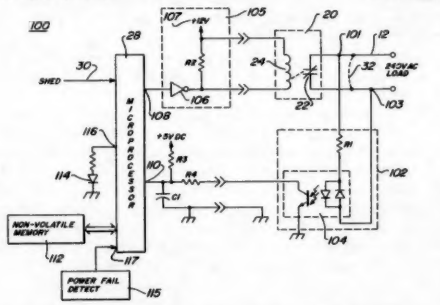
TAMPER DETECTION METHODS AND APPARATUS FOR LOAD MANAGEMENT TERMINALS

Jerry M. Kennon; Michael A. Murphy, and Kenneth C. Shuey, all of Raleigh, N.C., assignors to ABB Power T&D Company Inc., Raleigh, N.C.

Filed May 28, 1993, Ser. No. 68,768

Int. Cl.[6] G01R *11/24;* **G08B** *21/00*

U.S. Cl. 364—483 **14 Claims**



1. Apparatus for detecting tampering with a load management terminal, said terminal being connected to a power line and to a load, said terminal having a load control relay coupled in series to the power line wherein the load is selectably decoupled from the power line by opening the load control relay, said apparatus comprising:

a voltage sensor coupled to the load control relay for sensing whether voltage is present across said load control relay when said load control relay is open;

a timer for measuring elapsed time during which no voltage is sensed across said load control relay when said load control relay is open; and

an indicator for indicating tampering when the elapsed time measured by said timer exceeds a pre-determined time limit.

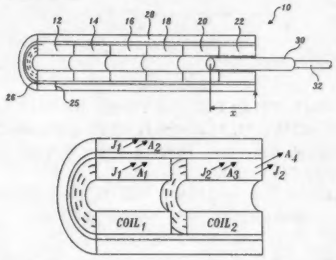
5,488,566
MULTI-COIL IMPEDANCE

Kevin G. Woolsey, Snohomish, Wash., assignor to Eldec Corporation, Lynnwood, Wash.

Continuation of Ser. No. 892,164, Jun. 2, 1992, abandoned. This application Apr. 28, 1995, Ser. No. 430,278

Int. Cl.[6] G01B *7/14*

U.S. Cl. 364—488 **7 Claims**



1. An inductive position sensor for detecting the position of an object, comprising:

a bobbin;

a movable target element coupled to the object, the target being mounted for movement along a longitudinal axis of the bobbin;

a plurality of serially connected coils, C, wound on the bobbin, each of said coils having N_i turns selected such that the plurality of coils have a total inductance that varies according to a desired inductance function, L(x), as the position of the target element is varied along the longitudinal axis of the bobbin, x being the position of the target element along said axis, wherein the number of turns, N_j, in each coil being equal to the number defined by the process which comprises:

determining a vector potential, A, and a current density, J, within the sensor due to a known current passing through the coils of the position sensor;

completing a set of equations having the form:

$$L(x) = \sum_{i=1}^{C} \sum_{j=1}^{C} N_i \left[-\oint_{ij} \right] N_j$$

wherein each equation relates a point on the desired inductance function to the number of turns, N_j, in each coil and the energy stored in the position sensor at a target element position x; and

optimizing the set of equations to determine the number of turns, N_j, that each coil should contain such that the total inductance of the position sensor varies according to the desired inductance function.

5,488,567
DIGITAL ANALYTE DETECTION SYSTEM

Fritz Allen, Corrales, and Thomas Niemczyk, Albuquerque, both of N.M., assignors to Acrogen, Inc., Oakland, Calif.

Continuation of Ser. No. 918,357, Jul. 23, 1992, Pat. No. 5,329,461. This application May 16, 1994, Ser. No. 243,153

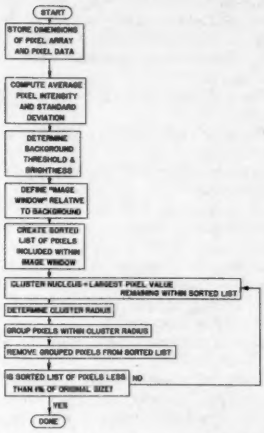
The portion of the term of this patent subsequent to Jul. 12, 2011, has been disclaimed.

Int. Cl.[6] G06G *7/75*

U.S. Cl. 364—497 **33 Claims**

19. A method for detecting the presence of a small number of analyte particles within a sample, said sample being divided into a multiplicity of distinct pixel regions where light emitted in each of said pixel regions is related to the amount of analyte in each of said pixel regions, comprising the steps of:

dimensioning each of said pixel regions such that the number of said analyte particles included within each of said pixel regions is less than a maximum detection threshold proportional to variation in optical responses emitted by said analyte particles;


START
STORE DIMENSIONS OF PIXEL ARRAY AND PIXEL DATA
COMPUTE AVERAGE PIXEL INTENSITY AND STANDARD DEVIATION
DETERMINE BACKGROUND THRESHOLD & BRIGHTNESS
DEFINE "IMAGE WINDOW" RELATIVE TO BACKGROUND
CREATE SORTED LIST OF PIXELS INCLUDED WITHIN IMAGE WINDOW
CLUSTER NUCLEUS = LARGEST PIXEL VALUE REMAINING WITHIN SORTED LIST
DETERMINE CLUSTER RADIUS
GROUP PIXELS WITHIN CLUSTER RADIUS
REMOVE GROUPED PIXELS FROM SORTED LIST
IS SORTED LIST OF PIXELS LESS THAN 1% OF ORIGINAL SIZE?
NO
YES
DONE

measuring emitted signals from each of said pixel regions relative to an ambient noise threshold, wherein the emitted signal from each pixel region is proportional to said optical responses of analyte particles included therein; and

counting, based on said measurements, the number of analyte particles within each of said pixel regions in order to determine the number of said analyte particles within said sample.

5,488,568
PLAYBACK METHOD AND SYSTEM FOR PROCESSING IMAGE DATA

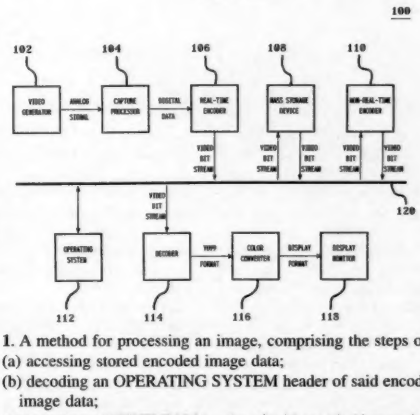
Michael Keith, Beaverton; Rohan Coelho; Stuart Golin, both of Hillsboro, and Brian Nickerson, Aloha, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jun. 16, 1993, Ser. No. 79,449

The portion of the term of this patent subsequent to Sep. 27, 2011, has been disclaimed.

Int. Cl.[6] H04L *13/00*

U.S. Cl. 364—514 R **32 Claims**



1. A method for processing an image, comprising the steps of:

(a) accessing stored encoded image data;

(b) decoding an OPERATING SYSTEM header of said encoded image data;

(c) decoding a BITSTREAM header of said encoded image data;

(d) decoding at least one component data field of said encoded image data;

(e) converting said decoded OPERATING SYSTEM header, said decoded BITSTREAM header, and said decoded at least one component data field for display; and

(f) displaying said converted image data, wherein step (d) comprises the steps of:

(1) decoding a Y-COMPONENT DATA field of said encoded image data;

(2) decoding a U-COMPONENT DATA field of said encoded image data; and

(3) decoding a V-COMPONENT DATA field of said encoded image data, wherein:

step (d)(1) comprises the steps of:

(A) decoding a Y-component four-byte MC VECTOR COUNT field;

(B) decoding a Y-component MC VECTORS field; and

(C) decoding a Y-component ENCODED DATA field, comprising interleaved binary tree codes and region codes;

step (d)(2) comprises the steps of:

(A) decoding a U-component four-byte MC VECTOR COUNT field;

(B) decoding a U-component MC VECTORS field; and

(C) decoding a U-component ENCODED DATA field, comprising interleaved binary tree codes and region codes; and

step (d)(3) comprises the steps of:

(A) decoding a V-component four-byte MC VECTOR COUNT field;

(B) decoding a V-component MC VECTORS field; and

(C) decoding a V-component ENCODED DATA field, comprising interleaved binary tree codes and region codes.

5,488,569

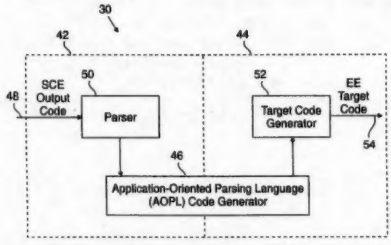
APPLICATION-ORIENTED TELECOMMUNICATION SYSTEM INTERFACE

Marc P. Kaplan, Aberdeen; Hui-Lan Lu, Marlboro, and Lev Slutsman, Wayside, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Dec. 20, 1993, Ser. No. 170,139

Int. Cl.[6] G06F *15/00*

U.S. Cl. 364—514 R **20 Claims**



1. A method of interfacing telecommunication service creation environments and service execution environments, comprising the steps of:

identifying a number of selected service creation environments to be interfaced to at least one selected service execution environment;

defining a set of intermediate code operations suitable for representing telecommunication services developed in said selected service creation environments;

parsing output code from one of said selected service creation environments to form a representation of said service creation environment output code;

generating an intermediate code from said representation of said output code using said set of intermediate code operations, such that said intermediate code preserves sufficient structural information contained within said service creation environment output code to permit optimization of the intermediate code; and

generating from said intermediate code a target code for said selected execution environment, such that said telecommunication service developed in said one of said selected service creation environments may be provided in said selected execution environment.

5,488,570

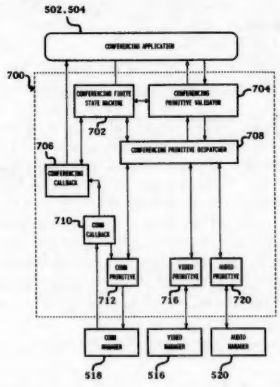
ENCODING AND DECODING VIDEO SIGNALS USING ADAPTIVE FILTER SWITCHING CRITERIA

Rohit Agarwal, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 158,855, Nov. 24, 1993. This application Jun. 29, 1994, Ser. No. 268,270

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—514 R **54 Claims**



1. A computer-implemented process for encoding video signals, comprising the steps of:

(a) encoding one or more training video frames using a selected quantization level to generate one or more encoded training video frames;

(b) decoding the encoded training video frames to generate one or more decoded training video frames;

(c) generating one or more energy measure values corresponding to the decoded training video frames;

(d) performing steps (a)–(c) for a plurality of quantization levels;

(e) selecting an energy measure threshold value for each of the quantization levels in accordance with the decoded training video frames;

(f) generating a first reference frame corresponding to a first video frame;

(g) encoding a block of a second video frame using the first reference frame and a selected quantization level to generate a block of an encoded second video frame;

(h) decoding the block of the encoded second video frame to generate a block of a second reference frame, wherein step (h) comprises the steps of:

(1) generating an energy measure value corresponding to the block of the encoded second video frame;

(2) comparing the energy measure value of step (h)(1) with the energy measure threshold value of step (e) corresponding to the selected quantization level for the block; and

(3) applying a filter to generate the block of the second reference frame in accordance with the comparison of step (h)(2); and

(i) encoding a third video frame using the second reference frame.

5,488,571

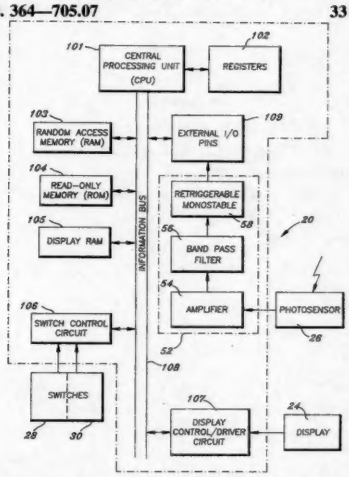
METHOD AND APPARATUS FOR DOWNLOADING INFORMATION FROM A CONTROLLABLE LIGHT SOURCE TO A PORTABLE INFORMATION DEVICE

Michael A. Jacobs, Naugatuck, and Mark A. Insero, Waterbury, both of Conn., assignors to Timex Corporation, Middlebury, Conn.

Filed Nov. 22, 1993, Ser. No. 155,326

Int. Cl.[6] G06F *15/16;1/00*

U.S. Cl. 364—705.07 **33 Claims**



1. A portable information device for receiving data from a data transmitter of the type having a CRT video display providing raster scanning of a screen at a horizontal scanning frequency and a vertical frame rate; and transmitting binary coded data in blocks of serial data bits as light pulses at a preselected pulse repetition rate less than said horizontal scanning frequency and greater than said vertical frame rate in synchronism with raster scanning of said screen so as to provide an integral number of one or more blocks for each vertical frame, said portable information device comprising:

(a) a portable casing adapted to be manipulated at a location spaced from, and within line of sight of, said screen;

(b) a photosensor mounted on said casing adapted to detect said light pulses when said portable casing is manipulated to direct said photosensor toward said screen;

(c) amplifier means within said casing connected to said photosensor to provide amplified binary coded receiver pulses corresponding to said light pulses,

(d) filter means within said casing connected to said amplifier means and adapted to pass signals at said preselected pulse repetition rate and to attenuate ambient artificial light frequencies;

(e) first means connected to receive said receiver pulses from said filter means and to provide binary coded data blocks adapted to vary between high and low logic levels at said preselected pulse repetition rate; and

(f) asynchronous data collection means within said casing connected to said first means.

5,488,572

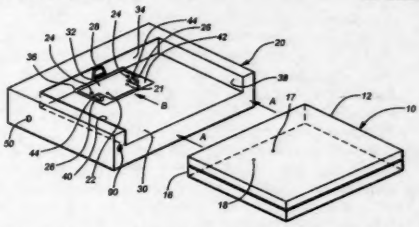
PORTABLE COMPUTER SYSTEM FOR DOCKING TO AN EXPANSION BASE UNIT

Brian V. Belmont, Houston, Tex., assignor to Compaq Computer Corp., Houston, Tex.

Filed May 4, 1994, Ser. No. 237,778

Int. Cl.[6] G06F *13/14*

U.S. Cl. 364—514 R **16 Claims**



1. A portable computer system for docking to an expansion base system, wherein the expansion base system includes an expansion bus for connection to expansion bus devices having resource requirements, a docking connector connected to the expansion bus, a device being coupled to the expansion bus and having resource requirements, and means responsive to certain of the portable computer system signals for docking and undocking the portable computer system, the portable computer system comprising:

a system bus;

a device being coupled to said system bus and having resource requirements;

an expansion connector connected to said system bus for connecting to the docking connector when the portable computer system is docked in the expansion base system;

means coupled to said system bus for determining if said resource requirements of said portable computer system bus device and the expansion bus device in the expansion base system conflict; and

means coupled to said conflict determining means and said system bus for transmitting an eject request signal to the expansion base system when said conflict is determined, wherein said eject request signal causes the expansion base system to undock the portable computer system.

5,488,573

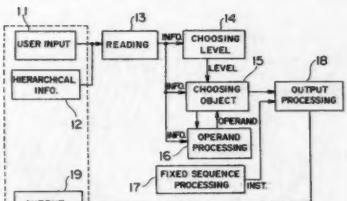
METHOD FOR GENERATING TEST PROGRAMS

Gary Brown, and Jiro Miyake, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 2, 1993, Ser. No. 115,102

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—578 **12 Claims**



1. A method for a data processor to generate a test program for verifying processors, said method comprising:

a first step of referencing input information and hierarchical information, wherein:

said hierarchical information comprises objects categorized in at least four levels: an instruction level as a level 1, an

instruction type level as a level 2, a sequence level as a level 3, and a function level as a level 4, where:

an object in said instruction level comprises an instruction name, instruction information and operand information,

an object in said instruction type level is a name of categories of objects in said instruction level,

an object in said sequence level is a combination of objects in said instruction type level, and

an object in said function level is a name of categories of objects in said sequence level; and

said input information regards how often each level of said hierarchical information is chosen; a second step of choosing a level from among said at least four levels of said hierarchical information according to said input information referenced at said first step, and selecting an object from said chosen level;

a third step of decrementing said chosen level where said chosen level is higher than said level 1, and selecting an object from said decremented level of said hierarchical information, using both a random number and said objcct selected from said chosen level, and repeating this selection step until an object is selected from the instruction level of said hierarchical information; and

a fourth step of generating a test program formed from at least one object of said instruction level of said hierarchical information selected in said second and said third steps.

5,488,574

Patent Not Issued For This Number

5,488,575

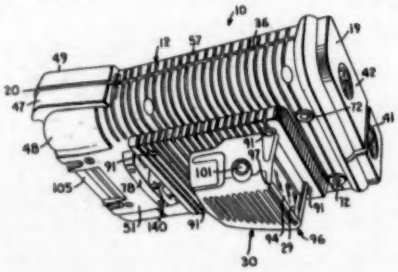
PORTABLE WORK STATION AND DATA COLLECTION TERMINAL INCLUDING SWITCHABLE MULTI PURPOSE TOUCH SCREEN DISPLAY

Arvin D. Danielson, Solon; Darald R. Schultz, Cedar Rapids, both of Iowa; Dennis Silva, San Jose, Calif.; Darrell L. Boatwright, Cedar Rapids, Iowa; Rickey G. Austin, Lisbon, Iowa, and Daniel E. Alt, Cedar Rapids, Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa

Continuation-in-part of Ser. No. 48,873, Apr. 16, 1993, which is a continuation-in-part of Ser. No. 948,034, Sep. 21, 1992, abandoned, which is a continuation of Ser. No. 347,602, May 3, 1989, abandoned, which is a continuation-in-part of Ser. No. 346,771, May 2, 1989, abandoned, and a continuation-in-part of Ser. No. 23,840, Feb. 26, 1993, abandoned, which is a continuation-in-part of Ser. No. 728,667, Jul. 11, 1991, abandoned. This application Apr. 12, 1994, Ser. No. 226,516

Int. Cl.[6] G06F *1/32*

U.S. Cl. 364—707 **9 Claims**



1. A portable data collection terminal comprising:

a housing including a display screen and a keyboard having a plurality of keys disposed in a frontal side of the housing, and a non-volatile memory;

the display screen including graphic data input means disposed coincident with a screen area of the display screen; and

a power management circuit means including means for saving electrical states, including input and output device states, to the non-volatile memory wherein said means includes means for trapping input-output instructions and for shadow writing such trapped input-output instructions to the non-volatile memory during normal operations of the portable data collection terminal; said power management circuit means further including means for shutting down the portable data collection terminal during periods of inactivity and for reactivating the portable data collection terminal by attempted input through one of the plurality of keys, the power management circuit means being adapted to recognize such first attempted input as a command to resume operation instead of an input of the function normally executed by the respective one of the plurality of keys.

5,488,576

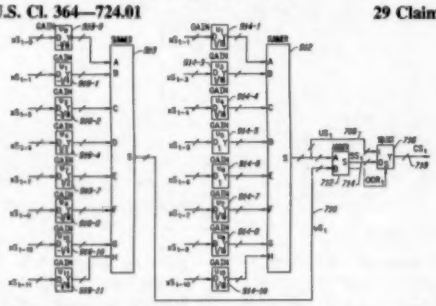
AMPLITUDE ADAPTIVE FILTER

David R. Main, Boulder Creek, Calif., assignor to The 3DO Company, Redwood City, Calif.

Filed Feb. 22, 1994, Ser. No. 199,097

Int. Cl.[6] G06F *17/10*

U.S. Cl. 364—724.01 **29 Claims**



1. Digital filter apparatus for use with a plurality of input samples, comprising:

a plurality of implementing filters, each coupled to receive said input samples and each of which produces a respective plurality of output samples, each t'th output sample in the plurality produced by any one of said implementing filters corresponding to a respective t'th output sample in the plurality produced by any other of said implementing filters; and

combining circuitry coupled to receive said output samples of said implementing filters, and which produces a plurality of combined output samples, each t'th combined output sample being selectably one of a plurality of functions of the t'th output samples of said implementing filters,

a first one of said functions producing said t'th combined output sample as the sum of the t'th output samples of at least a first and a second one of said implementing filters.

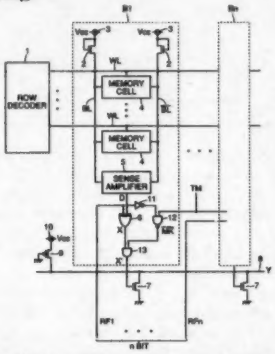
5,488,577

Patent Not Issued For This Number

5,488,578
SEMICONDUCTOR MEMORY DEVICE INCLUDING BIT CHECK FUNCTION AND TESTING METHOD USING THE SAME

Akira Yamada, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 26, 1994, Ser. No. 296,395
Claims priority, application Japan, Sep. 3, 1993, 5-219879
Int. Cl.[6] G11C *15/00*
U.S. Cl. 365—49 **10 Claims**



1. A semiconductor memory device, comprising:

a plurality of memory cells each for storing one-bit data therein;

reading/writing means for reading data from said plurality of memory cells and writing data to said plurality of memory cells;

a plurality of comparing means provided corresponding to said plurality of memory cells for comparing a plurality of data signals corresponding to data read out from said plurality of memory cells by said reading/writing means with a plurality of reference signals externally applied corresponding to the plurality of data signals, correspondingly, wherein each of said comparing means generates a result signal indicating whether or not each data signal matches a corresponding reference signal when the corresponding reference signal is at a first logic level, and generates a result signal indicating a match irrespectively of whether or not each data signal matching the corresponding reference signal when the corresponding reference signal is at a second logic level; and

determination signal generating means for generating a determination signal indicating a match when all of result signals from said plurality of comparing means indicate a match and for generating a determination signal indicating a mismatch when any of the result signals from said plurality of comparing means indicates a mismatch.

5,488,579
THREE-DIMENSIONALLY INTEGRATED NONVOLATILE SRAM CELL AND PROCESS

Umesh Sharma; Jim Hayden, and Howard C. Kirsch, all of Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.

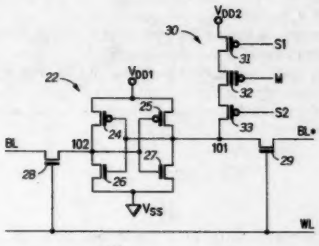
Filed Apr. 29, 1994, Ser. No. 235,735
Int. Cl.[6] G11C *11/40*
U.S. Cl. 365—185 **7 Claims**

1. An integrated circuit nonvolatile memory, comprising:

a static random access memory cell portion for storing a bit of binary information;

a first switch having a first terminal coupled to a first storage node of the static random access memory cell portion, and a second terminal, the first switch responsive to a first control signal;

a thin film transistor nonvolatile memory cell having a first current electrode coupled to the second terminal of the first switch, a second current electrode, and a control electrode; and



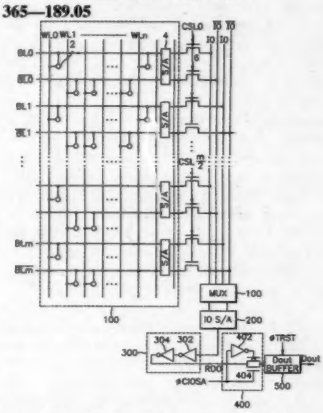
a second switch having a first terminal coupled to a first power supply voltage terminal, and a second terminal coupled to the second current electrode of the thin film transistor nonvolatile memory cell, the second switch responsive to a second control signal;

wherein the volatile memory cell is formed in first, second, third, and fourth layers of polysilicon, the thin film transistor nonvolatile memory cell and the first and second switches are formed in the third and fourth layers of polysilicon, the third and fourth layers of polysilicon overlying the first and the second layers of polysilicon.

5,488,580
SEMICONDUCTOR INTEGRATED CIRCUIT FOR OUTPUTTING DATA WITH A HIGH RELIABILITY

Soon-Kyu Park, Cheonahn, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed May 12, 1994, Ser. No. 241,855
Claims priority, application Rep. of Korea, May 12, 1993, 1993-8145
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—189.05 **9 Claims**



1. A semiconductor integrated memory circuit, comprising:

a plurality of memory cells for storing memory data, said memory cells arranged in a matrix of rows and columns, each row of memory cells connected by a bit line and each column of memory cells connected by a word line;

a plurality of bit line sense amplifiers, each bit line sense amplifier corresponding to one of said bit lines, said plurality of bit line sense amplifiers sensing memory data transmitted from one of said columns of memory cells to each of said bit lines when a word line is selected by a first memory address signal and when a row address strobe signal is in an active state;

a plurality of column select lines for selectively transmitting desired memory data sensed by said plurality of sense amplifiers to a latching circuit when a column is selected by a

second memory address signal and when a column address strobe signal is in an active state;

a data output buffer for outputting said desired memory data latched by said latching circuit; and

switching means interposed between said latching circuit and said data output buffer to selectively connect said latching circuit to said data output buffer in response to a control signal.

5,488,581

SEMICONDUCTOR MEMORY DEVICE

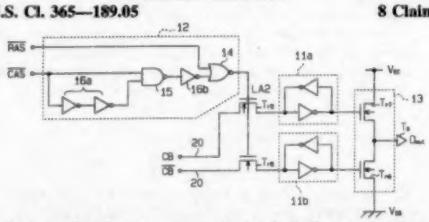
Mitsuhiro Nagao; Kohji Shimbayashi, and Yoshiyuki Ishida, all of Kasugai, Japan, assignors to Fujitsu Limited, Kawasaki, and Fujitsu VLSI Limited, Kasugai, both of, Japan

Filed Aug. 11, 1994, Ser. No. 288,927

Claims priority, application Japan, Jan. 28, 1993, 5-270984

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—189.05 **8 Claims**



1. A semiconductor memory device including a plurality of memory cells from which cell data is read out as read data based on at least one control signal provided to the memory device, the semiconductor memory device comprising:

a transfer gate for receiving read data from one of said memory cells and for outputting said read data;

a transfer gate controller for producing a latch control signal based on first and second control signals provided to the memory device, and for supplying said latch control signal to said transfer gate to control the switching of said transfer gate;

a latch circuit for latching said read data sent from said transfer gate; and

an output buffer for producing data in accordance with said read data latched by said latch circuit, said output buffer operating to output the produced data in cooperation with said latch circuit even when said transfer gate is turned off,

wherein said transfer gate controller includes a delay circuit and a logic circuit, said logic circuit having an output terminal connecting to said transfer gate, a first input terminal receiving the first control signal and a second input terminal receiving the second control signal via said delay circuit, said delay circuit controlling the level-switching timing for said latch control signal in such a way as to turn on said transfer gate after a first delay time from a change in potential level of the second control signal and as to turn OFF said transfer gate after a second delay time from a subsequent change in potential level of the second control signal, and

wherein said second delay time is longer than said first delay time.

5,488,582

NON-DISRUPTIVE, RANDOMLY ADDRESSABLE MEMORY SYSTEM

Rafael C. Camarota, San Jose, Calif., assignor to Atmel Corporation, San Jose, Calif.

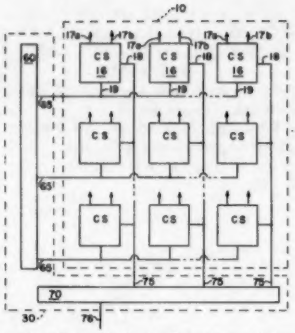
Continuation of Ser. No. 907,709, Jul. 2, 1992, abandoned.

This application Aug. 25, 1994, Ser. No. 296,616

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—189.05 **15 Claims**

3. A configurable logic array comprising:



a plurality of configurable logic elements, said logic elements having at least two configuration states;

a plurality of control store elements arranged in a two-dimensional array such that each element is associated with a particular row and column of the array, said control store elements for selecting the configuration states of said configurable logic elements;

programming means for programming said control store elements, said programming means being capable of directly programming a subset of said control store elements without substantially disrupting the configuration control signals provided by others of said control store elements, said programming means comprising:

row decode means including a plurality of word lines, each said word line connecting to the control store elements in a single row of said two-dimensional array; and

column decode means including a plurality of bit lines, each said bit line connecting to the control store elements in a single column of said two-dimensional array;

each control store element comprising:

a bistable latch having two states and providing a configuration control signal;

a switch responsive to a selected one of said word lines to connect said bistable latch to a selected one of said bit lines; and

a buffer coupled to said configuration control signal, and generating therefrom a buffered configuration control signal.

5,488,583

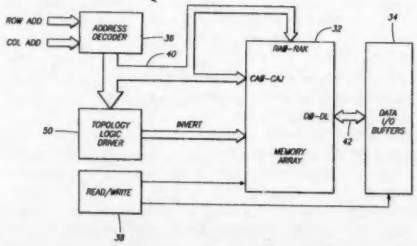
MEMORY INTEGRATED CIRCUITS HAVING ON-CHIP TOPOLOGY LOGIC DRIVER, AND METHODS FOR TESTING AND PRODUCING SUCH MEMORY INTEGRATED CIRCUITS

Adrian E. Ong; William K. Waller, and Paul S. Zagar, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Sep. 22, 1994, Ser. No. 311,582

Int. Cl.[6] G11C *7/00;29/00*

U.S. Cl. 365—201 **16 Claims**



1. A memory integrated circuit chip, comprising:

a memory array of a predefined circuit topology, the memory array having a plurality of memory cells and multiple access lines coupled to associated memory cells;

an address decoder to provide an address for selectively accessing one or more memory cells in the memory array;

I/O buffers to temporarily hold data written to and read from the memory cells in the memory array;

a read/write controller to manage data write and data read operations which transfer data between the I/O buffers and the addressed memory cells; and

a topology logic driver to selectively invert the data being written to and read from the addressed memory cells, the topology logic driver selectively inverting the data for certain addressed memory cells and not inverting the data for other addressed memory cells based upon location of the addressed memory cells in the circuit topology of the memory array.

5,488,584

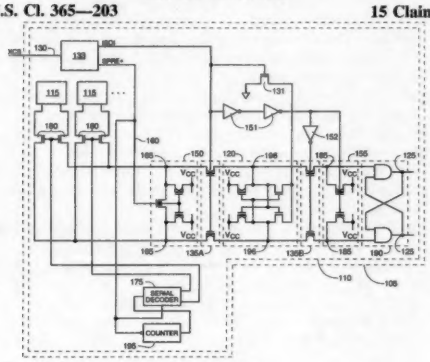
CIRCUIT AND METHOD FOR EXTERNALLY CONTROLLING SIGNAL DEVELOPMENT IN A SERIAL ACCESS MEMORY

Huy T. Vo, and Loren L. Mclaury, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Aug. 26, 1994, Ser. No. 296,397

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—203 **15 Claims**



1. A multiport memory, comprising:

a) a plurality of memory cells for storing a plurality of bits;

b) an output port for presenting a data signal representative of one of the plurality of bits of a selected one of said memory cells;

c) a sampling circuit electrically interposed between said memory cells and said output port, said sampling circuit receiving the bit of the selected memory cell, and said sampling circuit developing the data signal;

d) a control node for receiving an external control signal coupled to said sampling circuit, a frequency of the external control signal determined externally by a user, wherein the frequency of said external control signal controls an amount of development of said data signal by said sampling circuit, said data signal driven to said output port from said sampling circuit;

e) a first information node interposed between said plurality of memory cells and said sampling circuit;

f) a second information node interposed between said output port and said sampling circuit;

g) a generator circuit for generating an internal control signal in response to said external control signal, said internal control signal having a first pulse and a second pulse;

h) an isolation means responding to said internal control signal to alternately electrically isolate said sampling circuit from said first information node and from said second information node in order to control an amount of said signal development;

i) first precharge means for precharging said first information node to a first precharge potential; and

j) a second precharge means for precharging said second information node to a second precharge potential, wherein said first information node is precharged when isolated from said sampling circuit and said second information node is precharged when isolated from said sampling circuit.

5,488,585

CIRCUIT FOR GENERATING COLUMN DECODER ENABLE SIGNAL IN A SEMICONDUCTOR DEVICE

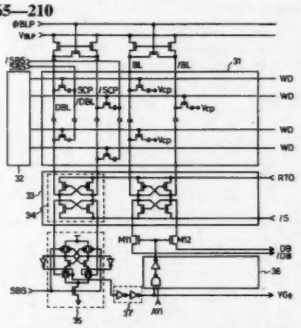
Hong S. Kim, Kyungki-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Inc., Rep. of Korea

Filed Aug. 22, 1994, Ser. No. 294,085

Claims priority, application Rep. of Korea, Aug. 20, 1994, 1993-16245

Int. Cl.[6] G11C *7/02*

U.S. Cl. 365—210 **5 Claims**



1. A circuit for generating a column decoder enable signal in a semiconductor device, comprising:

true and complementary dummy bit lines constructed in a normal cell array, each of the dummy bit lines including dummy cells; and

a dummy bit line sensing amplifier connected to the true and complementary dummy bit lines and adapted to generate a column decoder enable signal using data from the true and complementary dummy bit lines.

5,488,586

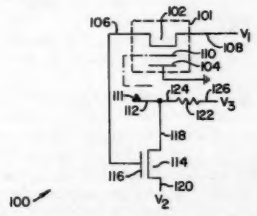
METHOD AND APPARATUS FOR ERASING AN ARRAY OF ELECTRICALLY ERASABLE PROGRAMMABLE READ ONLY MEMORY CELLS

Raminda Madurawe, Sunnyvale, and Dominik Schmidt, San Jose, both of Calif., assignors to Altera Corporation, San Jose, Calif.

Filed Oct. 24, 1994, Ser. No. 328,303

Int. Cl.[6] G11C *11/40*

U.S. Cl. 365—218 **19 Claims**



1. An apparatus for erasing memory cells while preventing overerasure of the cells comprising:

a memory cell having a gate, a drain, a source, and a floating gate from which charge must be removed by placing a potential thereacross to erase said memory cell;

an erase node for applying said potential across said floating gate;

a stop transistor having a gate directly coupled to said drain of said memory cell, a source, and a drain directly coupled to said erase node, said stop transistor preventing overerasure of said memory cell when a threshold voltage is reached on said gate of said stop transistor; and

a resistive element having a first terminal coupled to said drain of said stop transistor and a second terminal.

5,488,587

NON-VOLATILE DYNAMIC RANDOM ACCESS MEMORY

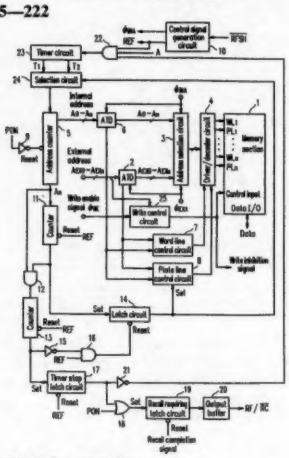
Katsumi Fukumoto, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 20, 1994, Ser. No. 325,957

Claims priority, application Japan, Jan. 20, 1993, 5-262648; Jan. 28, 1994, 6-008795

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—222 **20 Claims**



1. An NVDRAM comprising:

volatile memory cells which require a refreshing operation for retaining content stored therein;

non-volatile memory cells which permit content stored therein to be rewritten;

address generation means for automatically generating in sequence respective addresses of the volatile memory cells and the non-volatile memory cells in accordance with a clock signal;

self-refresh means for performing the refreshing operation by sequentially rewriting the content stored in each volatile memory cell based on the addresses generated by the address generation means;

refresh timing means for measuring a duration for which the self-refresh means continually performs the refreshing operation;

self-store starting means for determining whether or not duration of the refreshing operation as measured by the refresh timing means has exceeded a predetermined time amount; and

self-store means for, when the self-store starting means determines that the duration of the refreshing operation as measured by the refresh timing means has exceeded the predetermined time amount, stopping the refreshing operation by the self-refresh means and for performing a storing operation by sequentially transferring the content stored in the volatile memory cells to the non-volatile memory cells to be stored therein based on the addresses generated by the address generation means.

5,488,588

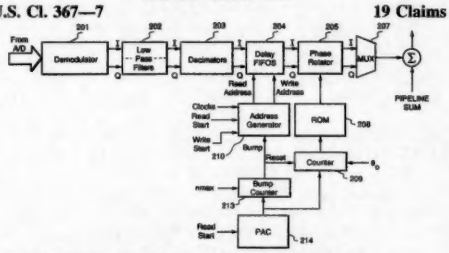
ULTRASONIC IMAGER HAVING WIDE-BANDWIDTH DYNAMIC FOCUSING

William E. Engeler, Scotia, and Christopher M. W. Daft, Schenectady, both of N.Y., assignors to General Electric Company, Schnectady, N.Y.

Filed Sep. 7, 1994, Ser. No. 301,751

Int. Cl.[6] G03B *42/06*

U.S. Cl. 367—7 **19 Claims**



1. A digital baseband imaging system comprising:

a plurality of transducers arranged in a sequence form an array;

means for selectively operating said transducers in a transmission mode to produce propagating energy pulses from electrical driving signals; and

means for forming a beam from analog electrical detection signals produced in response to detection of reflected pulses by said transducers operating in a reception mode, said beamforming means comprising a plurality of receive channels, each receive channel being coupled to a corresponding one of said plurality of transducers, wherein each of said receive channels comprises:

analog-to-digital conversion means for converting said analog electrical detection signals into digital signal samples;

demodulation means for basebanding said digital signal samples to form complex samples;

filter means for filtering said complex samples;

selecting means for dynamically selecting complex samples to provide dynamic group delay of said filtered complex samples; and

phase rotating means for dynamically rotating the phase of said selected complex samples to provide dynamic phase focus of said selected complex samples.

5,488,589

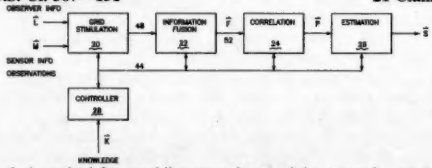
NEURAL NETWORK BASED THREE DIMENSIONAL OCEAN MODELER

Christopher M. DeAngelis, Cranston, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 18, 1994, Ser. No. 324,640

Int. Cl.[6] G06T *1/40;17/00*

U.S. Cl. 367—131 **21 Claims**



1. A method for providing an estimate of the state of a moving contact comprising the steps of:

providing a device for estimating the state of said contact;

inputting into said device information about a location of an observer during a sequence of time, information from at least one sensor about a position of said moving contact relative to said observer during said sequence of time, and a-priori knowledge;

transforming the inputted information into a series of three dimensional geographical grids with each grid having a plurality of cells; and

analyzing said geographical grids to produce an estimate of the state of the contact with respect to the location of the observer.

5,488,590

MAGNETO-OPTICAL OVERWRITE RECORDING AND REPRODUCING SYSTEM

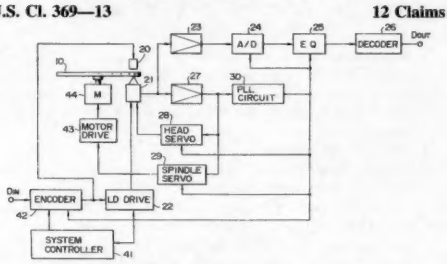
Tetsu Watanabe, Tokyo, and Tamotsu Yamagami, Kanagawa, both of, Japan, assignors to Sony Corporation, Japan

Continuation of Ser. No. 825,542, Jan. 24, 1992, abandoned. This application Sep. 6, 1994, Ser. No. 301,045

Claims priority, application Japan, Jan. 28, 1991, 3-025061

Int. Cl.[6] G11B *7/00;11/00*

U.S. Cl. 369—13 **12 Claims**



1. A magneto-optical recording and reproducing system for recording data onto a magneto-optical disk having a recording layer and for reproducing the recorded data, comprising:

motor drive means for rotating the magneto-optical disk about its axis;

first means for irradiating the magneto-optical disk with at least one pulsed laser beam to bring to at least a Curie temperature the recording layer to form adjacent partially overlapping recording tracks on the magneto-optical disk, the adjacent partially overlapping recording tracks bounded by a pair of unrecorded magneto-optical guard tracks;

magnetic field means for successively applying to each adjacent partially overlapping recording track a magnetic field to switch the normal component of magnetic domain orientations within each track;

means for modulating the magnetic field means in accordance with input data to be recorded;

second means for detecting magnetic domain orientations within each recorded track and generating a detection signal in response to the changes in magnetic domain orientations, the second means irradiating each recorded track with at least one laser beam having a wavelength less than that of the pulsed laser beam; and

signal processing means for converting the detection signal into data representative of the input data.

5,488,591

IMPROVED MAGNETO-OPTICAL RECORDING APPARATUS FOR DIGITAL SIGNAL INFORMATION

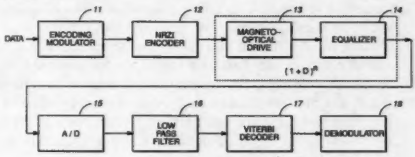
Michio Kobayashi; Hiroshi Hirayama, and Satoshi Nebashi, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Sep. 20, 1994, Ser. No. 309,286

Claims priority, application Japan, Dec. 24, 1993, 5-328592

Int. Cl.[6] G11B *11/00*

U.S. Cl. 369—13 **24 Claims**



1. A magneto-optical recording apparatus, comprising:.

a modulator for RLL (Run-Length Limited) encoding recording data;

a NRZI (Nonreturn to Zero Inverse) encoder, coupled to said modulator, for NRZI-encoding an obtained RLL code;

a magneto-optical drive, coupled to said encoder, for reading out signals from a magneto-optical recording medium;

an equalizer, coupled to said drive, for equalizing a read-out analog signal obtained from the magneto-optical recording medium into a waveform $(1+D)^n$ (n is a positive integer), while assuming that delay time for one bit period of said read-out signal is D, in such a manner that n is made to be at least 3 in a case where an amplitude ratio of a shortest waveform output and a longest waveform output of said read-out analog signal is ½ or more;

a low pass filter coupled to said equalizer, and

a Viterbi decoder that is coupled to said low pass filter and uses the difference between a sample value obtained by quantizing an output from said low pass filter and an expected value obtained from a theoretical value of a data column so as to make the most probable path to be decoding data.

5,488,592

OPTICAL PICKUP DEVICE FOR MAGNETO-OPTICAL DISC REPRODUCING SYSTEM

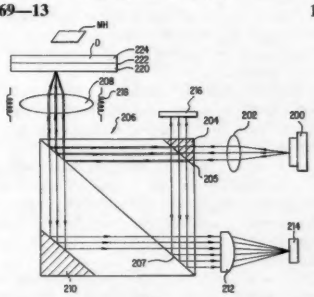
Jin Tae Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 8, 1994, Ser. No. 337,493

Claims priority, application Rep. of Korea, Nov. 11, 1993, 93-23870

Int. Cl.[6] G11B *11/00*

U.S. Cl. 369—13 **11 Claims**



1. An optical pickup device for a magneto-optical disc reproducing system, comprising:

a light source for generating a laser beam in parallel;

a prism for transmitting a first portion of said laser beam which is irradiated from a first direction, for reflecting a second portion of said laser beam into a second direction perpendicu-

lar to said first direction and for reflecting a beam which is irradiated from a third direction in opposition to said first direction into a fourth direction in opposition to said second direction;

polarization beam splitting means for reflecting said first portion of said laser beam transmitted in the first direction into a fifth direction perpendicular to said first direction to irradiate said first portion onto a disc, for reflecting a first polarization component of a reflected beam irradiated onto said polarization beam splitting means from the disc in a sixth direction in opposition to the fifth direction to irradiate the first polarization component onto said prism in the third direction to be reflected in the fourth direction, for reflecting again in a seventh direction said first polarization component reflected in the fourth direction, for transmitting a second polarization component of a reflected beam irradiated from the disc in the sixth direction, and for transmitting the second polarization component in an eighth direction which has the same direction with the seventh direction;

a mirror for reflecting the second polarization component passing said polarization beam splitting means in the eighth direction; and

a photo-detector for detecting the first and second polarization components to thereby generate data signal.

5,488,593

DISC REPRODUCING METHOD AND APPARATUS WITH MULTIPLE HEADS

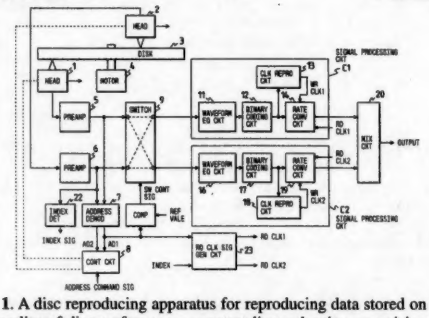
Shigeru Furumiya, and Yoshinari Takemura, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 10, 1993, Ser. No. 165,055

Claims priority, application Japan, Dec. 11, 1992, 4-331528

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—32 **8 Claims**



1. A disc reproducing apparatus for reproducing data stored on a plurality of disc surfaces at a constant linear density comprising:

(a) rotating means for rotating said disc surfaces at a constant rotational speed;

(b) a plurality of heads for reproducing said data on said plurality of disc surfaces at the same time respectively;

(c) position detection means for detecting positions of said plurality of heads to produce position signals;

(d) position control means for controlling radial positions of said plurality of heads such that a total of data rates of data reproduced by said plurality of heads in accordance with said position signals is constant, each of said disc surfaces being divided into N circumference zones, wherein said N is a natural number;

(e) N signal processing circuits for processing said reproduced data respectively, said N signal processing circuits having N processing speeds corresponding to N data rate ranges corresponding to said N circumference zones;

(f) switch means for supplying said reproduced data to said N signal processing circuits in accordance with at least one of said position signals such that data reproduced by each of said plurality of heads is supplied to a respective one of said N signal processing circuits corresponding to a respective one of said N circumference zones at which said each of plurality of heads is located; and

(g) combining means for combining said processed data signals from said N signal processing circuits into a combined serial data signal of which data rate corresponds to said total of data rates.

5,488,594

OBJECTIVE ACTUATOR FOR POSITIONING AN OPTICAL PICK-UP DEVICE

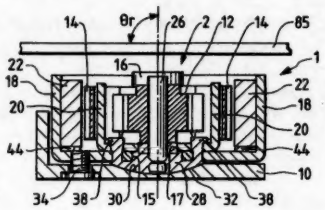
Fumio Kobayashi; Ikuo Kasuga, and Akira Miyamae, all of Nagano, Japan, assignors to K. K. Sankyo Seiki Seisakusho, Nagano, Japan

Filed Aug. 24, 1993, Ser. No. 110,960

Claims priority, application Japan, Aug. 24, 1992, 4-064732 U; Aug. 24, 1992, 4-064733 U; Jun. 11, 1993, 5-036788 U

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—44.14 **10 Claims**



1. An objective actuator comprising:

an object lens holder for holding an object lens, the object lens holder being mounted on a support shaft in a manner that the object lens holder is slidable along and rotatable about the support shaft;

a drive coil mounted on the object lens holder;

first yoke, formed by molding, provided with drive magnets, the first yoke being mounted in such manner that the drive magnets confront with the drive coil, the first yoke having a center hole which is larger in diameter than the support shaft, the first yoke and the support shaft being integrally connected by molding, the first yoke having arc-shaped side walls integrally formed on an outer circumferential edge of the first yoke; and

shaft holding means for stabilizing said support shaft, said shaft holding means including a shaft holding member defined by filling a resin at the center hole of the first yoke with the support shaft disposed in the center hole of the first yoke, the shaft holding member including a base portion.

5,488,595

OPTICAL INFORMATION RECORDING MEDIUM HAVING A TRANSITIONING THREE BIT ACCESS PIT GROUP AND OPTICAL INFORMATION RECORDING/REPRODUCING APPARATUS USING THE SAME

Takashi Takeuchi; Tadashi Saitoh, both of Fujisawa; Toshihiro Matsunaga, Kamakura; Masashi Mori, Chigasaki, and Hajime Fujiya, Kamakura, all of, Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Video Engineering, Inc., Kanagawa, both of, Japan

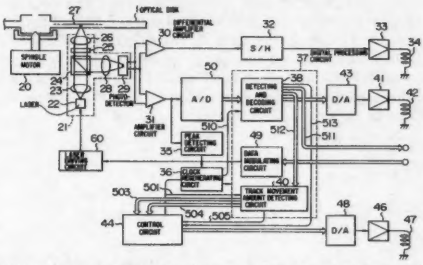
Continuation of Ser. No. 511,800, Apr. 20, 1990, abandoned. This application Sep. 21, 1993, Ser. No. 123,978

Claims priority, application Japan, Apr. 24, 1989, 1-101634; Dec. 15, 1989, 1-323756

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—54 **9 Claims**

1. An optical information recording medium which has a disk-like shape and in/from which information can be optically recorded/reproduced along a virtual track virtually defined in a



spiral or concentric circular form on the information recording medium following a predetermined modulation rule comprising:

a pair of wobbling pits provided for each predetermined data record unit, with a first and second wobbling pit being shifted in position in opposite radial directions, of the information recording medium with respect to a virtual track center; and

an access pit group provided at a specified position in association with said pair of wobbling pits, said access pit group having at least three access pits different from said wobbling pits and being provided within a predetermined range of at least six contiguous pit positions, and at least one of said three access pits being disposed in a pit position which is different from pit positions of access pit groups provided for adjacent tracks;

wherein one of said at least three access pits in said access pit group excepting said leading wobbling pit has a positional change of two pit positions between tracks adjacent to each other in the radial direction of the information recording medium in accordance with a track-to-track transition, a plurality of said access pit groups are periodically repeated for every predetermined number of tracks in the radial direction of the information recording medium and a fixed access pit is interposed between the positions of said one pit before and after the change.

5,488,596

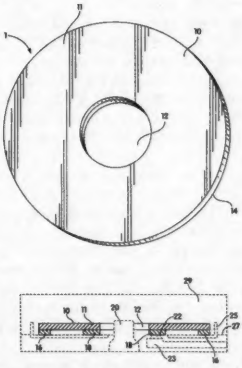
CLEANING DEVICE THAT DOES NOT ENGAGE THE DISC DRIVE SPINDLE

Robert D. Martin, 13 Wheeler Dam Rd., Salem, N.H. 03079

Filed Feb. 17, 1993, Ser. No. 18,114

Int. Cl.[6] G11B *15/18*

U.S. Cl. 369—71 **10 Claims**



1. A combination comprising an optical disc drive unit and a cleaning device for cleaning a laser lens of said optical disc drive unit,

said optical disc drive unit having a receiving area and a drive spindle which extends into said receiving area;

said cleaning device including a member adapted for insertion into said receiving area of said optical disc drive unit and

cleaning means supported by said member for cleaning said laser lens of said optical disc drive unit;

said member having an aperture extending therethrough, said aperture being constructed and designed to provide sufficient radial clearance about said drive spindle of said optical disc drive unit, which extends through at least a portion of said aperture when said member is fully inserted within said receiving area of said disc drive unit but does not engage nor otherwise contact said cleaning device, allowing said member and said cleaning means to remain stationary while said spindle is rotated;

wherein said laser lens moves upwardly and downwardly during a focusing sequence so as to contact said cleaning means, causing dust and contaminants to be removed therefrom; and said cleaning means surrounds said aperture.

5,488,597

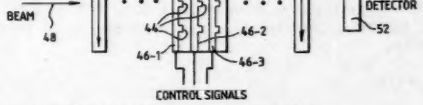
MULTILAYER OPTICAL MEMORY WITH MEANS FOR RECORDING AND READING INFORMATION

Alan G. Chen, 129 White Oak Ct. #6, Schaumburg, Ill. 60195, and David J. Brady, Champaign, Ill., assignors to Alan G. Chen, Schaumburg, Ill.

Filed Apr. 19, 1994, Ser. No. 229,653

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—100 **12 Claims**



12. A multilayer optical memory, comprising:

a plurality of stacked recording media layers each having a reflective control surface, each reflective surface having a different wavelength characteristic;

pits in the reflective surfaces, extending into the adjacent recording media layer; and

a tunable probe light beam which scans said layers, the wavelength of the tunable probe beam being chosen for reflection by a selected surface to interact with the pits therein.

5,488,598

OPTICAL PICKUP USING SPLIT BEAMS IMPINGING ON DIFFERENT PHOTODETECTOR AREAS

Kiyonobu Endo; Kazuya Matsumoto, and Tetsuro Kuwayama, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 77,405, Jun. 16, 1993, abandoned, which is a continuation of Ser. No. 658,428, Feb. 20, 1991, abandoned, which is a continuation of Ser. No. 349,963, May 8, 1989, abandoned, which is a continuation of Ser. No. 832,651, Feb. 25, 1986, abandoned. This application Jul. 14, 1994, Ser. No. 275,328

Claims priority, application Japan, Feb. 28, 1985, 60-39050; Feb. 28, 1985, 60-39051; Apr. 8, 1985, 60-72733

Int. Cl.[6] G11B *7/00;11/00*

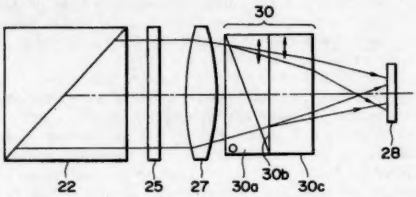
U.S. Cl. 369—120 **12 Claims**

1. An optical pickup apparatus comprising:

light projection means for projecting a light beam generated by a light source onto a recording medium;

light separation means for separating a light beam reflected by the recording medium into first and second light beams;

light converging means for respectively converging the first and second light beams;



a first detector and a second detector, formed on a common substrate, for detecting the first and second light beams, respectively, and for producing detection outputs, a light receiving portion of each of said first and second detectors being divided into a plurality of areas for respectively detecting an area of a spot of light produced by the first and second light beams, wherein one of said first and second light receiving portions is located before a focusing position of one of the first and second light beams and the other light receiving portion is located after a focusing position of the other light beam; and

processing means for obtaining a focusing error signal on the basis of the outputs of said first and second detectors.

5,488,599

OPTICAL PICK-UP DEVICE WITH A MULTIFUNCTIONAL PRISM

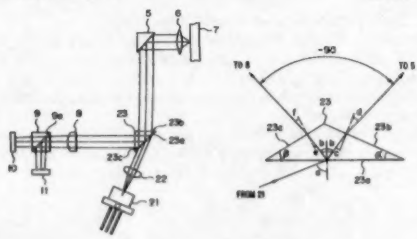
Hiroshi Akiyama, and Yoshitaka Takahashi, both of Yokohama, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1994, Ser. No. 191,599

Claims priority, application Japan, Feb. 5, 1993, 5-040714; Aug. 27, 1993, 5-234336; Sep. 3, 1993, 5-242124; Dec. 28, 1993, 5-349198

Int. Cl.[6] G11B *7/135*

U.S. Cl. 369—112 **11 Claims**



1. An optical pickup device, which comprises:

a light source having a light flux output of non-circular cross-section;

a multi-functional single body prism in optical alignment with said light source;

at least one light directing optical member configured to focus light received from said multi-functional prism onto a optical recording medium and to direct light reflected from said optical recording medium to said multi-functional prism; and

a light detection system aligned with said multi-functional prism and configured to receive light reflected by said optical recording medium;

wherein said multi-functional prism has at least one face configured to shape said light flux outputted from said light source to a substantially circular beam, to direct said beam to said at least one light directing member, to separate light reflected from said optical recording medium from said source light, and to guide said reflected light separated from said source light to said light detection system; and

wherein a following expression is established in said multi-functional prism, such that an incidence angle of said light flux outputted from said semiconductor laser chip light source is a, and an angle between an incidence face of said multi-functional prism for said light flux and a first outgoing irradiation face of said multi-functional prism for said light flux subjected to beam shaping is α, an angle between said incidence face and a second outgoing irradiation face of said multi-functional prism from which said light flux subjected to light separation guided from said multi-functional prism is β, and an index of refraction of a material for said multi-functional prism is n:

$$\alpha+\beta+\left|\sin^{-1}\left[n\sin\left\{\sin^{-1}\left(\frac{\sin a}{n}\right)-\alpha\right\}\right]\right|+\left|\sin^{-1}\left[n\sin\left\{\sin^{-1}\left(\frac{\sin a}{n}\right)-\beta\right\}\right]\right|=90^{\circ}$$

5,488,600

DIFFERENTIAL OPTICAL SWITCH FOR DATA MULTIPLEXING IN AN OPTICAL FIBER LOOP OF AN OPTICAL INFORMATION STORAGE APPARATUS

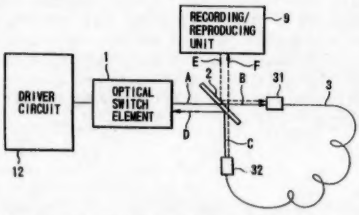
Yutaka Yamanaka, Tokyo, Japan, assignor to NEC Corporation, Japan

Division of Ser. No. 67,996, May 27, 1993, Pat. No. 5,384,728. This application Aug. 22, 1994, Ser. No. 294,065

Claims priority, application Japan, May 29, 1992, 4-138134

Int. Cl.[6] G11B *7/00*; H04B *10/00*

U.S. Cl. 369—116 **6 Claims**



1. An optical information storage apparatus comprising:

a differential type optical switch element having a first terminal for emitting a first optical output and receiving a first optical input, and a second terminal for emitting a second optical output and receiving a second optical input, the first and second optical outputs being light pulses to read/write an optical information storage medium, the first and second optical inputs being light pulses to drive the optical switch element, each of the terminals switching from a non-emission state to an emission state in accordance with an amplitude difference between the first and second optical inputs, the first optical output being propagated to the first optical input through a first optical path, the second optical output being propagated to the second optical input through a second optical path;

an optical fiber constituting a common optical path common to the first and second optical paths and having a light-reflecting surface on one end face of the optical fiber to reflect the light pulses, and a read/write surface on an other end face to read/write the light pulses, the common optical path guiding the first and second optical outputs written through the read/write surface to the light-reflecting surface, and the first and second optical outputs reflected by the light-reflecting surface to the read/write surface to output the optical outputs from the read/write surface; and

optical path separating/multiplexing means for separating/multiplexing the common optical path from/with the first and second optical paths, the first and second optical outputs emitted from the differential type optical switch element being multiplexed to be commonly incident on the read/write surface of the optical fiber through the optical path separating/

multiplexing means, the optical outputs read from the read/write surface of the optical fiber being separated into the first and second optical inputs to be selectively incident onto the first and second terminals of the differential type optical switch element, respectively.

5,488,601

PHOTOELECTRIC SENSOR, INFORMATION RECORDING SYSTEM, AND INFORMATION RECORDING METHOD

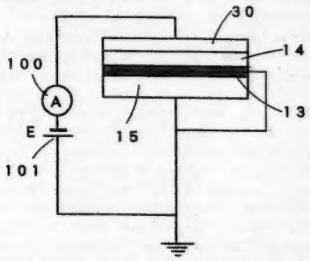
Shinichi Sakano; Daigo Aoki; Minoru Utsumi; Masanori Akada, and Osamu Shimizu, all of Tokyo, Japan, assignors to Dai Nippon Printing Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1993, Ser. No. 141,110

Claims priority, application Japan, Jan. 26, 1992, 4-287983; Jan. 27, 1993, 5-011721; Apr. 28, 1993, 5-102244; Jul. 14, 1993, 5-173988

Int. Cl.[6] G11B *7/00*; G11C *13/04*

U.S. Cl. 369—120 **108 Claims**



1. A photoelectric sensor comprising a photoconductive layer stacked on an electrode, said photoelectric sensor being semiconductive, wherein when an electric field having an intensity of 10^5 V/cm to 10^6 V/cm is applied to said photoelectric sensor during voltage application when unexposed to light, a passing current density through said photoelectric sensor of 10^{-4} A/cm^2 to 10^{-7} A/cm^2 is obtained, and when said photoelectric sensor is exposed to light during voltage application, the amount of photo-induced current increases during exposure to light with time, and increases to an amount more than a calculated theoretical amount of photoelectric current generated by the light exposure, wherein the increased photo-induced current gradually decreases after the termination of the light exposure during continuous voltage application.

5,488,602

INFORMATION RECORD/REPRODUCING APPARATUS AND INFORMATION RECORDING MEDIUM

Akihiko Yamano, Yokohama; Hiroyasu Nose, Zama; Toshimitsu Kawase, Atsugi; Toshihiko Miyazaki, Isehara, and Takahiro Oguchi, Atsugi, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 953,202, Sep. 29, 1992, abandoned, which is a continuation of Ser. No. 513,931, Apr. 24, 1990, abandoned. This application Jun. 29, 1994, Ser. No. 267,516

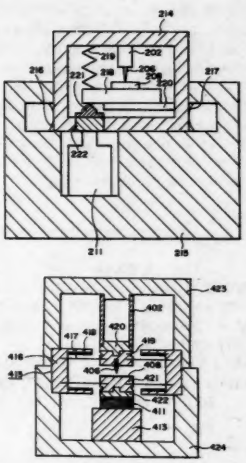
Claims priority, application Japan, Apr. 25, 1989, 1-103453; Apr. 5, 1990, 2-091452

Int. Cl.[6] G11B *9/00*

U.S. Cl. 369—126 **25 Claims**

1. A method for mounting containing means in which a probe electrode and a recording medium are sealed, in an apparatus for performing at least one of information recording and reproducing, comprising the steps of;

mounting the containing means in which the probe and the recording medium are sealed, in the apparatus; and



electrically connecting an electrode of said containing means to an electrode of said apparatus when said containing means is mounted in said apparatus.

5,488,603

OPTICAL INFORMATION RECORDING REPRODUCING APPARATUS WITH FIRST AND SECOND ELECTROKINETIC TRANSDUCERS AT RESPECTIVE DISTANCES

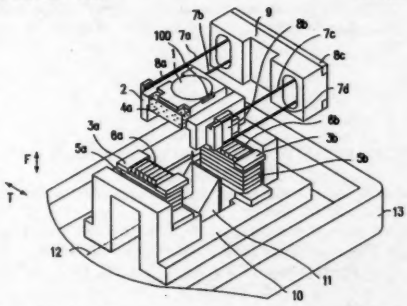
Hironori Tomita; Tohru Nakamura; Takuya Wada, all of Katano, and Hiroyuki Nakamura, Kobe, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 17, 1994, Ser. No. 261,739

Claims priority, application Japan, Jun. 21, 1993, 5-174739

Int. Cl.[6] G11B *7/095*

U.S. Cl. 369—219 **38 Claims**



1. An optical information recording/reproducing apparatus for optically writing and reproducing information on a disk-shape recording medium, the optical information recording/reproducing apparatus comprising:

a base;

an objective lens for converging a light beam on the disk-shape recording medium, an optical axis of the objective lens being perpendicular to the disk-shape recording medium;

an actuator for actuating the objective lens along an optical axis direction in which the optical axis of the objective lens extends and along a radial direction of the disk-shape recording medium, wherein the actuator is fixed on the base and includes supporting means for supporting the objective lens, and a first electrokinetic type transducing means and a second electrokinetic type transducing means for driving the support-

ing means along at least one of the optical axis direction and the radial direction of the disk-shape recording medium, the first and second electrokinetic type transducing means interposing the supporting means, and a distance between the first electrokinetic type transducing means and the base being different from a distance between the second electrokinetic type transducing means and the base; and

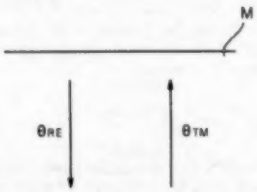
an optical member for directing a light beam to travel between the first electrokinetic type transducing means and the base and to be incident on the objective lens.

5,488,604

MAGNETO-OPTICAL DISK HAVING ZERO KERR ROTATION ANGLE AT ROOM TEMPERATURE

Nobuyasu Negishi, Tsurugashima, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 2, 1994, Ser. No. 300,384
Claims priority, application Japan, Sep. 7, 1993, 5-221953
Int. Cl.[6] G11B *7/29;13/04*
U.S. Cl. 369—275.2 **10 Claims**



1. A magneto optical disc comprising:

a substrate having a disc shape; and

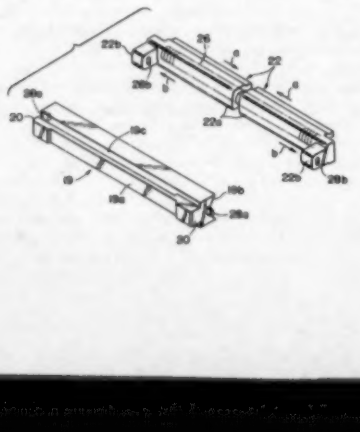
a single ferrimagnetic layer formed on said substrate for recording information as a magnetization condition therein, said ferrimagnetic layer comprising material which Kerr rotation angle at a room temperature is substantially zero and which Kerr rotation angle at a predetermined reproducing temperature has a predetermined value other than zero, said predetermined reproducing temperature being higher than said room temperature and lower than a Curie point of the ferrimagnetic layer.

5,488,605

DISC CARTRIDGE WITH EASILY ASSEMBLED SLIDER AND SHUTTER MEANS

Yoshikazu Ishimatsu, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 201,259, Feb. 24, 1994, abandoned. This application May 12, 1995, Ser. No. 440,002
Claims priority, application Japan, Feb. 25, 1993, 5-059381
Int. Cl.[6] G11B *23/03*
U.S. Cl. 369—291 **10 Claims**



1. A disc cartridge comprising:

a housing main body for rotatably housing therein a disc-shaped recording medium, the housing main body having an opening on at least one surface;

shutter means slidably connected to the housing main body for opening and closing the opening, the shutter means movable between a closed position that closes the opening and a first open position that at least partially opens the opening, and between the closed position and a second open position that at least partially opens the opening, the shutter means being positioned adjacent to a first side of the housing main body when in the first open position, the shutter means being positioned adjacent to a second side of the housing main body when in the second open position;

a first slider movable in a direction parallel to the movement of the shutter means, the first slider being entirely disposed within a region between a center of the opening and the first side of the housing main body when the opening is closed by the shutter means;

a second slider movable in the direction parallel to the movement of the shutter means, the second slider being entirely disposed within a region between the center of the opening and the second side of the housing main body when the opening is closed by the shutter means;

stopper means disposed between the first and second sliders for preventing movement of any portion of the first slider beyond the center of the opening towards the second side, and for preventing movement of any portion of the second slider beyond the center of the opening towards the first side;

force applying means for pressing the first and second sliders toward each other so that end portions of the sliders are abutted against the stopper means; and

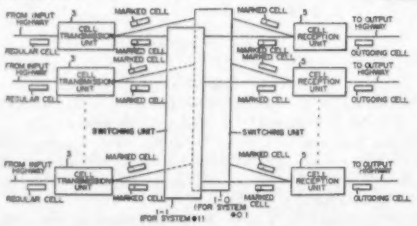
guide means connected to the shutter means for engaging the first and second sliders so that the guide means pushes the first slider towards the first side when the shutter means moves towards the first position, and so that the guide means pushes the second slider towards the second side when the shutter means moves towards the second position.

5,488,606

PROCEDURE FOR SWITCHING-OVER SYSTEMS

Satoshi Kakuma; Shuji Yoshimura; Kazuo Hajikano; Masami Murayama, and Yuzo Okuyama, all of Kanagawa, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 21, 1994, Ser. No. 216,149
Claims priority, application Japan, Sep. 20, 1993, 5-233460
Int. Cl.[6] H04L *12/56*
U.S. Cl. 370—16 **4 Claims**



1. A redundant ATM (asynchronous transfer mode) exchange for communications between a plurality of input highways and a plurality of output highways, the exchange comprising:

a switching system #0 and a switching system #1 each having switching means operating in parallel with each other, one system being a master and another being a slave;

cell transmission means for each input highway, for receiving cells from a respective input highway and transmitting a copy of each received cell to each of the system #0 and system #1, for assigning a mark designating either a master indication or a slave indication to each cell received from said input highway, wherein a cell having the master indication is transmitted

to the switching means operating as a master and a cell having the slave indication to the switching means operating as a slave; and

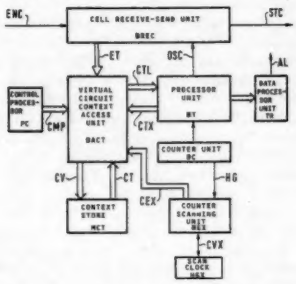
cell reception means for each output highway, for receiving cells from the switching means of the system #0 and the switching means of the system #1 and transmitting one of said cells to a respective output highway based on said mark, for storing cells having the master indication after detecting at least one cell having said mark corresponding to a system switchover, for detecting that marks of said cells have changed to indicate said system switchover for each path currently set, and for switching-over between one system and another system without duplication and loss of cells by outputting the cells having the master indication stored in said cell reception means.

5,488,607

ASYNCHRONOUS TIME-DIVISION MULTIPLEX COMMUNICATION MEDIUM VIRTUAL CIRCUIT THROUGHPUT MEASURING DEVICE

Paul Vinel, Velizy, and Marc Dieudonne, Igny, both of, France, assignors to Alcatel N.V., Amsterdam, Netherlands

Continuation of Ser. No. 899,738, Jun. 17, 1992, abandoned. This application Apr. 26, 1994, Ser. No. 233,205
Claims priority, application France, Jun. 18, 1991, 91 07430
Int. Cl.[6] H04J *1/16*
U.S. Cl. 370—17 **14 Claims**



5. Device for detecting the absence of a predetermined minimal throughput of a virtual circuit conveying cells over an asynchronous time-division multiplex transmission medium, comprising:

a store in which the virtual circuit is assigned a context in the form of stored throughput data relating to said virtual circuit, said stored throughput data including an indication of when a previous cell of the virtual circuit in question was received;

timing means;

scanning and evaluating means responsive to said timing means for regularly accessing and processing said stored throughput data and producing a cut off call detection signal if said stored throughput data including said indication of when said previous cell of was received corresponds to a maximum possible average throughput rate since the receipt of said previous cell that is below a predetermined minimum throughput, and

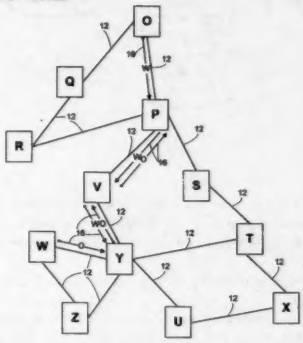
throughput calculation means for updating said stored throughput data in response to the receipt of a subsequent cell on said virtual circuit and storing said updated throughput data in said store.

5,488,608

METHOD AND SYSTEM FOR ROUTING PACKETS IN A PACKET COMMUNICATION NETWORK USING LOCALLY CONSTRUCTED ROUTING TABLES

George H. Flammer, III, Cupertino, Calif., assignor to Metricom, Inc., Los Gatos, Calif.

Filed Apr. 14, 1994, Ser. No. 227,774
Int. Cl.[6] H04J *3/26*
U.S. Cl. 370—85.13 **12 Claims**



6. A system for routing packets of data in a packet data communication network without a network directory comprising:

a plurality of nodes in a network, each node including an identifier indicative of coordinate location, said identifier including a coordinate value referenced to a terrestrial grid;

means for addressing a packet to an ultimate destination node by designating in a packet header said ultimate destination node only by said coordinate value of said ultimate destination node and without designating a complete intermediate path to said ultimate destination node such that the network is free to route the packet via any intermediate path to said ultimate destination node;

means at each of said plurality of nodes for selecting upon first receipt of a packet for a destination node a neighboring node by using said identifier indicative of coordinate location of said destination node; and

means at each of said plurality of nodes for storing a routing table entry for an ultimate destination of a packet, said routing table entry selected by an identifier for said ultimate destination node and including information identifying a neighboring node as a forwarding node for said ultimate destination.

5,488,609

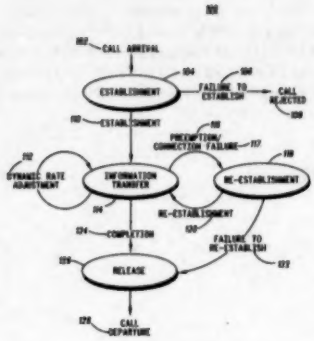
DYNAMIC RATE ADJUSTMENT FOR OVERLOAD CONTROL IN COMMUNICATION NETWORKS

Michael G. Hluchyj, Wellesley, and Whay C. Lee, Cambridge, both of Mass., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 123,773, Sep. 20, 1993, abandoned. This application Jun. 29, 1995, Ser. No. 496,350
Int. Cl.[6] H04J *3/22*
U.S. Cl. 370—84 **5 Claims**

1. A device for dynamic rate adjustment for overload control in a connection-oriented communication network by managing call-level resource allocation on selected link, each link being associated with a predetermined node for marking the link's status, such that existing connections share the burden of releasing resources for accommodating new connections, comprising:

A) a rate adjustment determiner, operably coupled to a rate adjustment controller, for, upon receiving a rate adjustment trigger signal, determining a new agreed rate for the connection and providing the new agreed rate to the rate adjustment controller, and



B) the rate adjustment controller, operably coupled to the rate adjustment determiner, for adjusting the previously agreed rate to a new agreed rate determined by the rate adjustment determiner,

wherein the rate adjustment determiner determines a new agreed rate such that:

C) where the previously agreed rate is equal to a predetermined acceptable value, the rate adjustment determiner determines whether any link along a path supporting the connection is marked and one of C1–C2;

C1) where at least one link is marked, leaving the previously agreed rate unchanged,

C2) where all links along the path are unmarked, determines whether a predetermined available capacity associated with the path is greater than or equal to a predetermined requested value and one of C2a–C2b;

C2a) where the predetermined available capacity associated with the path is greater than or equal to the requested value, determines that the new agreed rate is equal to the requested value, and signals the rate adjustment controller to adjust the agreed rate accordingly,

C2b) where the predetermined available capacity associated with the path is less than the requested value, leaving the previously agreed rate unchanged,

D) where the previously agreed rate is equal to a predetermined requested value, the rate adjustment determiner determines whether any link along a path supporting the connection is marked and one of D1–D2;

D1) where all links along the path are unmarked, leaving the previously agreed rate unchanged,

D2) where at least one link is marked, determines that the new agreed rate is equal to a predetermined acceptable value, and signals the rate adjustment controller to adjust the agreed rate accordingly,

E) where the previously agreed rate is a value other than a predetermined requested value and a predetermined acceptable value, the rate adjustment determiner determines whether any link along a path supporting the connection is marked and one of E1–E3;

E1) where all links along the path are unmarked and the available capacity associated with the path is less than the requested value, leaving the previously agreed rate unchanged,

E2) where all links along the path are unmarked and the available capacity associated with the path is greater than or equal to the requested value, determines that the new agreed rate is equal to the requested value, and signals the rate adjustment controller to adjust the agreed rate accordingly,

E3) where at least one link is marked, determines that the new agreed rate is equal to the acceptable value, and signals the rate adjustment controller to adjust the agreed rate accordingly,

wherein the new agreed rate is determined utilizing the steps of one of F–G:

F) where the available capacity associated with the path is greater than or equal to a predetermined requested value, setting the agreed rate to the requested value,

G) where the available capacity associated with the path is less than a predetermined requested value, leaving the agreed rate unchanged.

5,488,610

COMMUNICATION SYSTEM

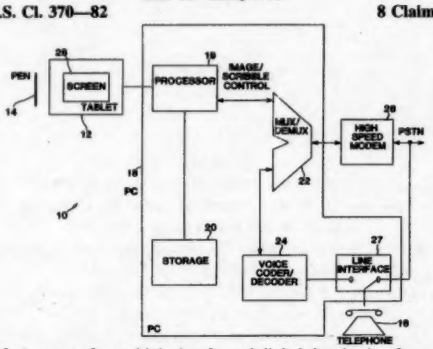
Stephen Morley, Stoke Gifford, United Kingdom, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 12, 1994, Ser. No. 274,203

Claims priority, application European Pat. Off., Aug. 26, 1993, 93306797

Int. Cl.[6] H04J *3/02*

U.S. Cl. 370—82 **8 Claims**



2. A system for multiplexing framed digital data having frames of predetermined size with other data for transmission on a single physical channel, comprising:

a) means for receiving from a source of framed digital data the framed digital data at a first frame rate, wherein the source of framed digital data is controlled by a first clock;

b) means for receiving the other data;

c) means for generating multiplexer frames under the control of a second clock, the multiplexer frames being of a substantially predetermined size, wherein an individual multiplexer frame:

(1) incorporates the framed digital data and/or other data according to whether the framed digital data and/or the other data is available for inclusion in that individual multiplexer frame and a header containing information about the contents of that individual multiplexer frame, and

(2) has a length chosen so that the multiplexer frames are transmitted at a second frame rate wihich is faster than the first frame rate.

5,488,611

METHOD AND ARRANGEMENT FOR DATA TRANSMISSION

Frans Zijderhand, Eindhoven, Netherlands, and Alfred L. M. Weling, Nürnberg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

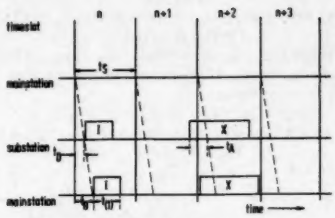
Filed Jul. 7, 1992, Ser. No. 909,899

Claims priority, application European Pat. Off., Jul. 8, 1991, 91201768

Int. Cl.[6] H04J *3/26*

U.S. Cl. 370—108 **15 Claims**

1. Method of transmitting data packets from any of a plurality of anonymous mobile sub-stations to a stationary main station via a common channel subdivided into time slots whose length and synchronization are determined by a corresponding time slot distribution of a data transmission signal transmitted by the main station, said data packets having a length essentially equal to the time length, t_S, of the time slots, comprising the steps:



(a) prior to transmitting the data packets, any one of the plurality of anonymous sub-stations first transmits a request-for-access packet which has a different configuration from that of the data packet, said request-for-access packet being substantially shorter than t_S and beginning substantially at the beginning of a time slot,

(b) upon receiving said request-for-access packet, the main station determines the time, t_B that elapses during said time slot from the beginning of the time slot to the time of receipt within the time slot, of the request-for-access packet,

(c) the main station then transmits a signal representative of said time, t_B, to the sub-station,

(d) said sub-station in response to receipt of the time, t_B transmits its data packets with an advancement-of-time, t_A, and a length, t(x), where $t_A=t_B$, t(x) substantially equals t_S and advancement-of-time means that the data packets are transmitted slightly before the start of a time slot such that the data packets when received by the main station are substantially synchronized with the time slot distribution of the main station.

5,488,612

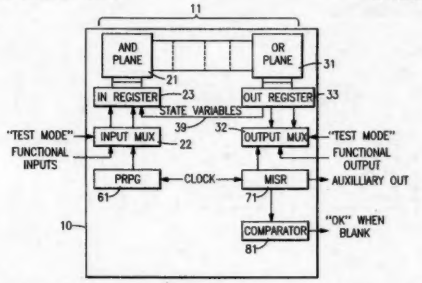
METHOD AND APPARATUS FOR FIELD TESTING FIELD PROGRAMMABLE LOGIC ARRAYS

William F. Heybruck, Charlotte, N.C., assignor to International Business Machines, Corporation, Armonk, N.Y.

Filed Oct. 4, 1993, Ser. No. 131,070

Int. Cl.[6] G06F *11/00*

U.S. Cl. 371—22.2 **2 Claims**



1. A self-testable, field programmable gate array having a plurality of individual gates, each of said gates comprising a non-volatile floating gate field effect transistor logically in series with a volatile field effect transistor, said gate array comprising means for selectively changing the state of selected non-volatile floating gate field effect transistors to program the gate array; said gate array being programmably divisible into four logical areas, said areas comprising:

a. a first logical area comprising a programmable logic gate array sea of gates having an AND-plane and an OR-plane;

b. a second logical area comprising pseudo random pattern generator register means to apply a pseudo random set of test patterns to the programmable logic gate array sea of gates;

c. a third logical area comprising multiple input signature register means to capture the output of the programmable logic gate array sea of gates with respect to test patterns generated by the pseudo random pattern generator means; and

d. a fourth logical area comprising comparator means to compare the input pseudo random set of test patterns received by the sea of gates to the sea of gates output received by the multiple input signature register means from the sea of gates.

5,488,613

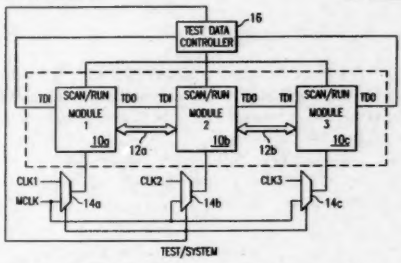
SCAN TEST CIRCUITS FOR USE WITH MULTIPLE FREQUENCY CIRCUITS

Thirumalai Sridhar, Hudson, N.H., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 511,677, Apr. 20, 1990, abandoned. This application Dec. 8, 1992, Ser. No. 988,383

Int. Cl.[6] G01R *31/28*

U.S. Cl. 371—22.3 **19 Claims**



19. Circuitry for testing a plurality of modules controlled by two or more system clocks of differing frequencies, comprising:

a master clock;

a test data controller means for performing run cycles using the system clocks;

a control circuit means for switching the control of said modules between said system clocks of differing frequencies and said master clock;

said test data controller means further for scanning test data through the modules using the master clock;

said test data controller means further for performing a run cycle on the modules using the master clock;

said test data controller means further for scanning additional test data through the modules using the master clock; and

said test data controller means for performing additional run cycles using the system clocks of differing frequencies.

5,488,614

INTEGRATED LOGIC CIRCUIT

Tomoaki Shima, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Mar. 23, 1993, Ser. No. 36,171

Claims priority, application Japan, Mar. 24, 1992, 4-066449

Int. Cl.[6] G06F *13/12*

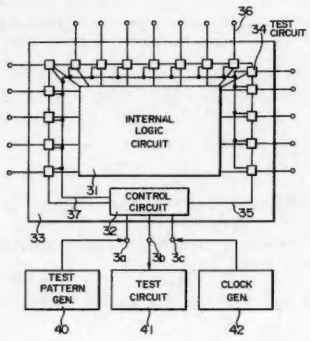
U.S. Cl. 371—22.3 **10 Claims**

1. A semiconductor integrated logic circuit comprising:

an internal logic circuit;

a plurality of input/output terminals respectively connected to said internal logic circuit;

a plurality of test circuits respectively interposed between said internal logic circuit and said input/output terminals, said test circuits forming a shift register by establishing a series signal path during a testing condition, each of said test circuits including first, second and third latch circuits, said first and third latch circuits being active in a common response to a first phase of a clock signal and said second latch circuit being active in response to a second phase of said clock signal, said second phase being opposite to said first phase of said clock signal.



5,488,615

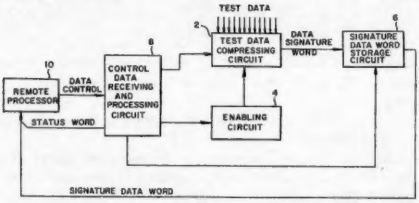
UNIVERSAL DIGITAL SIGNATURE BIT DEVICE

Noah Kunoff, Old Bethpage; Anant Patel, Hicksville, and Robert D. Melton, Commack, all of N.Y., assignors to AIL Systems, Inc., Deer Park, N.Y.

Filed Feb. 28, 1990, Ser. No. 486,315

Int. Cl.[6] H04B *17/00*

U.S. Cl. 371—22.4 **7 Claims**



1. A digital signature built-in-test device for testing a digital circuit, which comprises:

means for compressing test data received from the digital circuit being tested, the test data compressing means providing a signature data word corresponding to the test data received, the test data compressing means including a cascaded arrangement of a first linear feedback shift register, a second linear feedback shift register electrically coupled in series to the first linear feedback shift register, and a third linear feedback shift register electrically coupled in series to the second linear feedback shift register, each of the first, second and third linear feedback shift registers having a plurality of test data inputs which are electrically coupled to the digital test circuit and on which are provided the test data;

means for enabling the test data compressing means for a predetermined period of time, the enabling means providing an enable signal to the test data compressing means;

means for storing the signature data word from the test data compressing means; and

means for receiving and processing control data from a remote processor, the control data receiving and processing means providing control signals to the test data compressing means, signature data word storing means and enabling means;

wherein each of the first, second and third linear feedback shift registers includes a plurality of serially interconnected stages, each of the test data inputs of a respective linear feedback shift register being coupled to a respective one of the stages; and wherein the first linear feedback shift register includes fewer stages than the second linear feedback shift register, and the second linear feedback shift register includes fewer stages than the third linear feedback shift register.

5,488,616

SYSTEM FOR PROVIDING REVERSIBLE VARIABLE LENGTH CODES

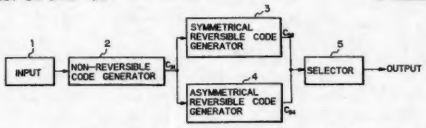
Yasuhiro Takishima; Masahiro Wada, and Hitomi Murakami, all of Saitama, Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Apr. 9, 1993, Ser. No. 44,472

Claims priority, application Japan, Apr. 17, 1992, 4-122822

Int. Cl.[6] H03M *7/40;13/00*

U.S. Cl. 371—30 **5 Claims**



1. A reversible instantaneously decodable variable length code generation system comprising;

means for providing symbols with occurrence probability of each symbol,

first encoding means for provisionally encoding said symbols to non-reversible variable length code according to occurrence probability of each symbol,

second encoding means for transforming said non-reversible code to asymmetrical reversible code,

third encoding means for transforming said non-reversible code to symmetrical reversible code, and

selection means for selecting at least one output of said second encoding means and said third encoding means to provide an instantaneously decodable reversible variable length code.

5,488,617

DATA PROCESSOR SYSTEM BASED ON AN (N, K) SYMBOL CODE HAVING SYMBOL ERROR CORRECTIBILITY AND PLURAL ERROR MENDABILITY

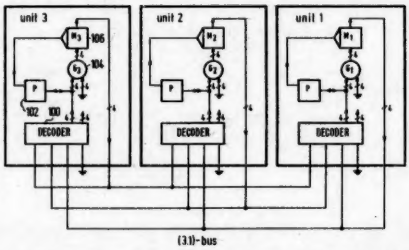
Carel-Jan L. Van Driel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 777,056, Oct. 16, 1991, abandoned. This application Sep. 12, 1994, Ser. No. 304,647

Claims priority, application European Pat. Off., Jan. 16, 1990, 90202747

Int. Cl.[6] G06F *11/10;* **H03M** *13/00*

U.S. Cl. 371—37.1 **7 Claims**



1. A data processing system based on a 100% redundancy four-symbol code word having both single-symbol error correctability and plural error mendability with respect to at least two symbols in one code word coexistently, said system having:

a. a decoder stage having an input for receiving said code word and to therefrom deriving two-symbol data words;

b. a processor stage fed by said decoder stage to process said data words for therefrom developing memory addresses and further data words;

c. an encoding stage having multiple encoder modules for receiving intendedly identical data word versions of a selection of said data words and fork in respective encoder modules, encoding unto respective different code symbols;

d. a memory stage having multiple memory modules each fed by a respective one of said encoder modules for, under control of said memory addresses, writing and reading all code symbols of an associated code word; and

e. feedback means fed by said memory modules for retrocoupling any code word read to said decoder stage; wherein said data processing system comprises at least one data processing unit, wherein any said unit has more than one but less than four different active encoder modules fed in parallel by corresponding processing unit for collectively processing one single of said version, for in respective memory modules of the data processing unit storing respective disjunct symbols of the data word version developed in said corresponding data processing unit.

5,488,618

ERROR DETECTING APPARATUS

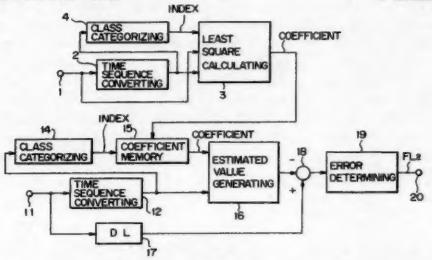
Tetsujiro Kondo, and Hideo Nakaya, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 22, 1994, Ser. No. 263,527

Claims priority, application Japan, Jun. 29, 1993, 5-184435

Int. Cl.[6] G06F *7/02*

U.S. Cl. 371—67.1 **6 Claims**



1. An error detecting apparatus for detecting an error of an input digital information signal, comprising:

coefficient generating means for inputting a plurality of information data, forming a class corresponding to a pattern of the information data, and outputting a coefficient for the class corresponding to a least square method;

means for inputting the input digital information signal and categorizing the input digital information signal as the class;

estimating means in communication with said coefficient generating means and with said means for inputting the input digital information signal for linear-primary-coupling the coefficient corresponding to the class and the input digital information so as to generate an estimated value of a future data of the input digital information;

means in communication with said estimating means for generating a difference value between a true value of the future data of the input digital information and an estimated value estimated by said estimating means; and

determining means in communication with said means for generating a difference value and having a comparing means, the comparing means being adapted for comparing the difference value with a predetermined threshold value so as to determine whether or not the input digital information signal is defective corresponding to the compared result of the comparing means.

5,488,619

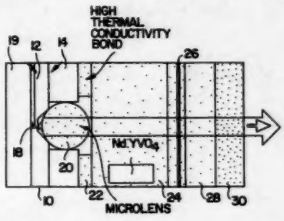
ULTRACOMPACT Q-SWITCHED MICROLASERS AND RELATED METHOD

Hagop Injeyan, Glendale, and Terry L. Holcomb, Torrance, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Oct. 6, 1994, Ser. No. 319,192

Int. Cl.[6] H01S *3/115*

U.S. Cl. 372—12 **10 Claims**



1. An array of Q-switched microlasers, comprising:

an array of individually addressable diode lasers adapted to produce an array of generally parallel output light beams;

an array of microlenses positioned in the array of generally parallel output light beams to provide collimation of the output beams;

a crystal functioning as a laser gain medium, positioned to receive the generally parallel output light beams from the diode lasers, such that the light beams operate to provide optical pumping of the laser gain material of the crystal;

an array of individually addressable electroabsorptive modulators formed in resonant cavities that are defined in part by the laser gain medium; and

means for selectively electrically biasing the electroabsorptive modulators periodically to provide a Q-switching function in which relatively higher power output peaks are obtained from selected elements of the microlaser laser array.

5,488,620

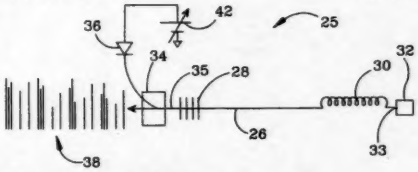
PASSIVELY MODE LOCKED-LASER AND METHOD FOR GENERATING A PSEUDO RANDOM OPTICAL PULSE TRAIN

Monica L. Minden, Calabasas, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 5, 1995, Ser. No. 369,050

Int. Cl.[6] H01S *3/098*

U.S. Cl. 372—18 **19 Claims**



1. A passively mode-locked laser, comprising:

an optical resonant cavity that is capable of sustaining the oscillation of a plurality of resonant modes having respective phases;

a saturable absorber that is positioned in the resonant cavity, said saturable absorber having a threshold beyond which a pseudo random pulse train is generated; and

a pump that injects power into the resonant cavity at a level at which the optical intensity that is incident on the saturable absorber exceeds said threshold.

5,488,621

LASER BIAS AND MODULATION CIRCUIT

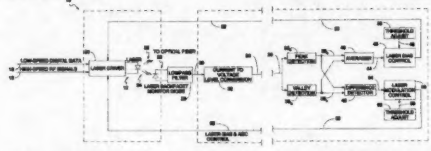
Michael R. Slawson, Raleigh, and James J. Stiscia, Garner, both of N.C., assignors to Alcatel Network Systems, Inc., Richardson, Tex.

Continuation of Ser. No. 898,702, Jun. 15, 1992, Pat. No. 5,268,916. This application Nov. 24, 1993, Ser. No. 158,166

The portion of the term of this patent subsequent to Aug. 23, 2011, has been disclaimed.

Int. Cl.[6] H01S *3/10*

U.S. Cl. 372—31 16 Claims



1. A method for maintaining constant light output for varying efficiencies and operating points of a laser diode modulated by a modulating signal, comprising the steps of:

sensing the light output and providing a sensed signal having a magnitude indicative thereof;

providing, in response to the sensed signal, a bias current feedback control signal for controlling a bias current provided to the laser diode, said bias current feedback control signal being provided in response to a midpoint of a highest absolute magnitude and a lowest absolute magnitude of the sensed signal; and

providing, in response to the sensed signal, a modulation current amplitude feedback control signal for controlling the modulation current amplitude used to modulate the bias current.

5,488,622

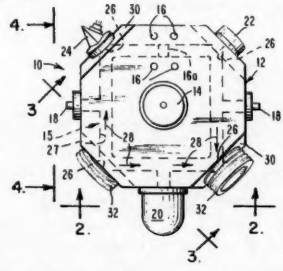
SIMPLIFIED DISPERSION EQUALIZATION FIELD COIL DESIGN FOR A MULTIOSCILLATOR RING LASER GYROSCOPE

Robert A. Mitchell, Woodland Hills, Calif., assignor to Litton Systems, Inc., Woodland Hills, Calif.

Filed Jul. 29, 1994, Ser. No. 283,393

Int. Cl.[6] H01S *3/00*

U.S. Cl. 372—33 12 Claims



1. A multioscillator ring laser gyroscope including a frame having an exterior face, means for producing a plasma discharge in the optical cavity of said gyroscope, and at least one coil on said face and so positioned thereon that a significant component of the magnetic field generated by the coil is colinear with the plasma discharge in the optical cavity.

5,488,623

MOLD-TYPE SEMICONDUCTOR LASER DEVICE WITH REDUCED LIGHT-EMITTING POINT DISPLACEMENT DURING OPERATION

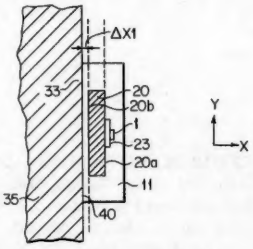
Shoji Kitamura; Yoichi Shindo, and Akira Amano, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Division of Ser. No. 43,482, Apr. 6, 1993, Pat. No. 5,444,726, which is a continuation-in-part of Ser. No. 788,601, Nov. 6, 1991, Pat. No. 5,355,385. This application Aug. 12, 1994, Ser. No. 289,574

Claims priority, application Japan, Nov. 7, 1990, 2-302258; Apr. 1, 1992, 4-85323; Jan. 22, 1993, 5-8679; Mar. 30, 1993, 5-70597

Int. Cl.[6] H01S *3/04*

U.S. Cl. 372—36 1 Claim



1. A semiconductor laser device comprising a laser diode element having at least one end face for emitting a laser beam, a lead frame for electrically controlling the laser diode element and having a planar major surface for mechanically supporting the laser diode element with a support member interposed therebetween, a sealing resin layer allowing the laser beam to pass therethrough and covering at least the laser diode element on the lead frame in a sealing manner, and an external fixing board, wherein a mounting surface of the sealing resin layer, placed against the external fixing board, is uniformly separated from an adjacent surface of the lead frame by a distance $\Delta X1$ (mm) defined by the following formula:

$$\Delta X1 \geqq (\Delta L/M)/(\alpha \times \Delta T)$$

where α is a linear expansion coefficient of the sealing resin layer,

ΔT is a change in ambient temperature,

ΔL is a tolerable shift of a laser beam spot on a divided photo diode of a pick-up device included with the semiconductor laser device in an optical disc system, and

M is an image forming magnification defined by a magnification of a lens system including at least one lens positioned along a distance in an optical path between a light emitting point of the laser diode element and the divided photo diode of the pick-up device.

5,488,624

RARE EARTH ION UPCONVERSION LASER SYSTEM

Robert J. Thrash, St. Charles, Ill., and Leo F. Johnson, Bedminster, N.J., assignors to Amoco Corporation, Chicago, Ill.

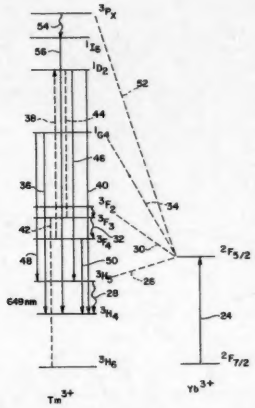
Continuation-in-part of Ser. No. 765,381, Sep. 25, 1991, Pat. No. D. 341,719. This application Feb. 8, 1994, Ser. No. 195,790

Int. Cl.[6] H01S *3/16*

U.S. Cl. 372—41 6 Claims

1. An upconversion laser system for convening relatively long wavelength, substantially coherent single band infrared radiation that is at least quasi-continuous to relatively short wavelength optical radiation, comprising:

a pumping source that has at least a quasi-continuous output of said substantially coherent single band infrared radiation;



an active lasant material comprising a fluoride crystal host, a sensitizer comprising a concentration of ytterbium sensitizer ions in said host that has a quantum energy level that is shifted from the $^4F_{5/2}$ state to the $^4F_{7/2}$ state by absorption of said infrared radiation and rapidly decay back to said $^4F_{5/2}$ state, an activator comprising a concentration of thulium activator ions in said host, as a percentage of available rare earth sites in said host in the range of 0.1 to 10 percent, that accept energy from at least some of said sensitizer ions that decay from said $^4F_{7/2}$ state to said $^4F_{5/2}$ state by substantially non-radiative transfer so that at least some of said activator ions have quantum energy levels that are raised from the $^3H_6$ state through at least one intermediate state to a relatively highest state during successive ones of said energy transfers from said sensitizer ions to said activator ions, and rapidly decay from said highest state to a relatively low state to produce substantially coherent radiation that has a shorter wavelength than said infrared radiation; and

an optical cavity for resonating said coherent radiation produced by said lasant material.

5,488,625

SEMICONDUCTOR LASER DEVICE HAVING CHIP-MOUNTED HEATING ELEMENT

Tomohiro Nakamori, Ichikawa; Hiroshi Hashimoto, Tokyo; Soya Endo, Tokyo; Hitoshi Machino, Tokyo, and Masanori Ishizu, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1993, Ser. No. 131,677

Claims priority, application Japan, Jan. 7, 1992, 4-268863; Jan. 7, 1992, 4-268864; Jan. 7, 1992, 4-268865; Nov. 13, 1992, 4-303564

Int. Cl.[6] H01S *3/025*

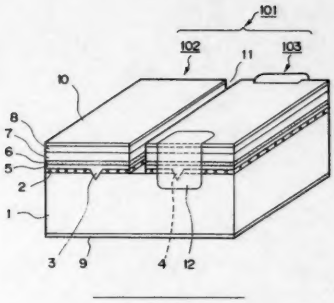
U.S. Cl. 372—50 **12 Claims**

1. A semiconductor laser device comprising:

a chip;

a laser element formed on said chip, said laser element being operable to emit a laser beam in a first direction; and

a heating element formed on the chip, said heating element comprising a heating laser element formed so as not to emit a laser beam in the first direction.



5,488,626

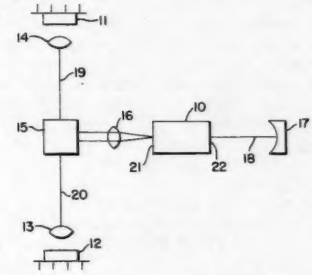
METHOD OF AND APPARATUS FOR PUMPING OF TRANSITION METAL ION CONTAINING SOLID STATE LASERS USING DIODE LASER SOURCES

Donald F. Heller, Bound Brook; Timothy C. Chin, Lebanon, both of N.J., and Jerzy S. Krasinski, Stillwater, Okla., assignors to Light Age, Inc., Warren, N.J.

Filed Jan. 14, 1991, Ser. No. 640,653

Int. Cl.[6] H01S *3/091*

U.S. Cl. 372—70 **16 Claims**



1. An apparatus for pumping a vibronic laser, which comprises:

a transition-metal ion-containing solid state vibronic laser gain medium;

means for exciting said laser medium to emit radiation said exciting means being a pumping source comprising at least one laser diode operating at a wavelength shorter than 750 nm; and

an optical resonator means for generating coherent radiation.

5,488,627

SPREAD SPECTRUM CLOCK GENERATOR AND ASSOCIATED METHOD

Keith B. Hardin; John T. Fessler, both of Lexington; Donald R. Bush, Winchester, and James J. Booth, Nicholasville, all of Ky., assignors to Lexmark International, Inc., Greenwich, Conn.

Filed Nov. 29, 1993, Ser. No. 160,077

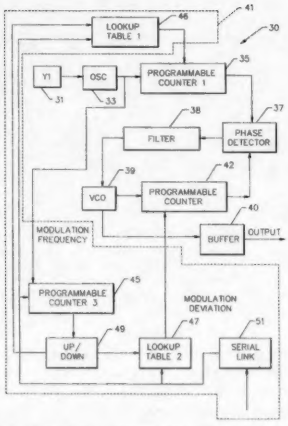
Int. Cl.[6] H03D *1/04*

U.S. Cl. 375—204 **31 Claims**

1. A clock circuit for generating a clock output signal with reduced amplitude electromagnetic interference (EMI) spectral components, said clock circuit comprising:

oscillator means for generating a reference frequency signal; and

spread spectrum clock generating means cooperating with said oscillator means for generating a spread spectrum clock output signal having a fundamental frequency and reduced amplitude EMI spectral components at harmonics of the fundamental frequency, said spread spectrum clock generating means comprising



clock pulse generating means for generating a series of generally rectangularly shaped electrical clock pulses; and

spread spectrum modulating means cooperating with said clock pulse generating means for modulating same to broaden and flatten amplitudes of impulse-shaped EMI spectral components which would otherwise be produced by said clock pulse generating means, said spread spectrum modulating means comprising frequency modulating means for frequency modulating said clock pulse generating means, said frequency modulating means comprising profile modulating means for modulating the clock pulse generating means with a periodic waveform having a percentage of frequency deviation profile as a function of percentage of a period (% Period) of the periodic waveform within an envelope defined by predetermined upper and lower bounds, wherein said predetermined upper bound for a second quadrant is defined by F_3 which is equal to

$$100\% \left(\frac{\% \text{ Period}}{25} \right),$$

wherein said predetermined lower bound is defined by F_4 which is equal to

$$100\% \left(\frac{\% \text{ Period}}{25} \right)^3;$$

wherein for a first quadrant between −25% to 0% Period the lower bound is equal to $-F_3$(−% Period) and the upper bound is equal to $-F_4$(−% Period); wherein for a third quadrant between 25% to 50% Period the lower bound is equal to F_4(50−% Period), and the upper bound is equal to F_3(50−% Period); and wherein for a fourth quadrant the lower bound is equal to $-F_3$(% Period−50) and the upper bound is equal to $-F_4$(% Period−50).

5,488,628

METHOD AND APPARATUS FOR TRANSITION ENCODING A LOGIC SIGNAL

Pierre-Yves Thoulon, Voreppe, France, assignor to Hewlett-Packard Company, Palo Alto, Calif.

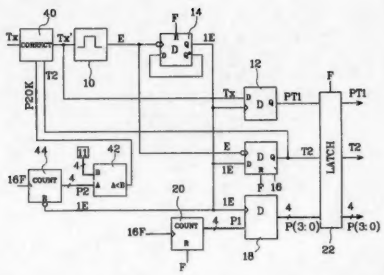
Filed Jan. 26, 1994, Ser. No. 187,320

Claims priority, application France, Jan. 26, 1993, 93 00997

Int. Cl.[6] H03K *7/04*

U.S. Cl. 375—239 **9 Claims**

1. A method of transition encoding a logic signal that may have one of a plurality of discrete speeds up to a maximum speed, the ratio between said maximum speed and the immediately lower discrete speed being equal to 2; the method comprising the steps of:



1. A signal processing circuit in use for receiving a signal modulated based on n-PSK including an in-phase component (Ich) of an information signal spread by a first spread code and a

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5,488,629

SIGNAL PROCESSING CIRCUIT FOR SPREAD SPECTRUM COMMUNICATIONS

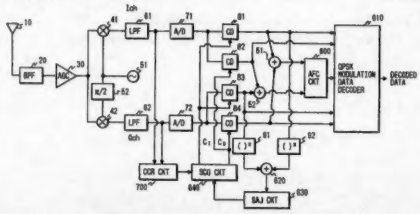
Kenichi Takahashi; Minako Takeishi, both of Kawasaki, and Hiroshi Onishi, Tokyo, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 17, 1994, Ser. No. 197,592

Claims priority, application Japan, Feb. 17, 1993, 5-027711; Feb. 24, 1993, 5-035099; Aug. 3, 1993, 5-192167; Jan. 4, 1993, 5-247911

Int. Cl.[6] H04B *1/707*

U.S. Cl. 375—206 **4 Claims**



1. A signal processing circuit in use for receiving a signal modulated based on n-PSK including an in-phase component (Ich) of an information signal spread by a first spread code and a

quadrature component (Qch) of the information signal spread by a second spread code in direct sequence spectrum spread communication comprising:

oscillating means (**51**) for generating an oscillating signal;

a frequency converter (**41**, **42**) for converting the modulated signal into the in-phase component (Ich) and the quadrature component (Qch) by the oscillating signal;

a spread code generator (**640**) for generating a third spread code (Ci) corresponding to the first spread code and a fourth spread code (Cq) corresponding to the second spread code;

a first correlating detector (**81**) for detecting a first correlation between the in-phase component (Ich) and the third spread code (Ci);

a second correlating detector (**83**) for detecting a second correlation between the quadrature component (Qch) and the third spread code (Ci);

a third correlating detector (**82**) for detecting a third correlation between the in-phase component (Ich) and the fourth spread code (Cq);

a fourth correlating detector (**84**) for detecting a fourth correlation between the quadrature component (Qch) and the fourth spread code (Cq);

an adder (**51**) for calculating one of a sum of the first correlation and the fourth correlation, and a sum of the second correlation and the third correlation;

a subtracter (**52**) for calculating one of a remainder between the second correlation and the third correlation, and a remainder between the first correlation and the fourth correlation, the correlations relating to the sum calculated by the adder (**51**) differing from the correlations relating to the remainder calculated by the subtracter (**52**); and

a frequency controller (**600**) for calculating a quotient of the sum calculated by the adder (**51**) and the remainder calculated by the subtracter (**52**), the quotient representing a frequency offset between a transmitter and a receiver, and for allowing the oscillating means (**51**) to correct a phase of the oscillating signal based on the quotient.

5,488,630

SYSTEM FOR ACQUIRING AND COMPRESSING PULSE TRAINS

Jean Huignard, Creteil, and Patrick Sauvin, Ris-Orangis, both of, France, assignors to Sodena, Halluin, France

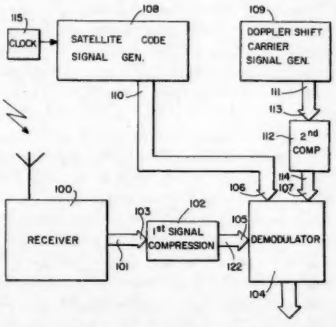
PCT No. PCT/FR93/00941, § 371 Date Jun. 1, 1994, § 102(e) Date Jun. 1, 1994, PCT Pub. No. WO94/08251, PCT Pub. Date Apr. 14, 1994

PCT Filed Sep. 27, 1993, Ser. No. 244,515

Claims priority, application France, Jan. 1, 1992, 92 11981

Int. Cl.[6] **H04B** *1/707;1/69*

U.S. Cl. 375—206 **9 Claims**



1. A receiver system for receiving pulse trains transmitted by satellites, the system comprising:

receiver means (**100**) for receiving said pulse trains and for delivering at an output signal trains representative of said pulse trains;

first compression means (**102**) for compressing signal trains by a factor n, said first compression means having an input (**103**) connected to said output (**101**) of the receiver means (**100**) and said first compression means having an output;

demodulator means (**104**) having three inputs, a first input (**105**), a second input (**106**), and a third input (**107**), said output (**106**) of said first compression means (**102**) being connected to the first input (**105**) of said demodulator means (**104**);

first and second generators (**108**, **109**) for delivering at respective outputs thereof (**110**, **111**) respectively satellite code signals and trains of Doppler shift carrier signals, the output (**110**) of the first generator (**108**) being connected to the second input (**106**) of the demodulator means (**104**); and

second compression means (**112**) for compressing signal trains by a factor n, said second compression means having an input (**113**) and an output (**114**), said input of said second compression means (**112**) being respectively connected to the output (**111**) of said second generator (**109**) and said output of said second compression means to the third input (**107**) of said demodulator means (**104**).

5,488,631

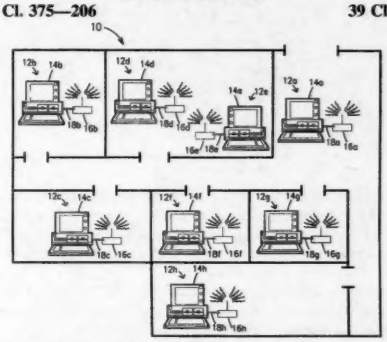
WIRELESS DIRECT-SEQUENCE SPREAD SPECTRUM TDMA COMMUNICATIONS SYSTEM

Kenneth S. Gold, Bell Canyon, and Hubert M. France, Jr., Palos Verdes Estates, both of Calif., assignors to Radio Connect Corporation, Culver City, Calif.

Filed Oct. 31, 1994, Ser. No. 331,925

Int. Cl.[6] **H04B** *1/707*

U.S. Cl. 375—206 **39 Claims**



37. A device for wireless transmission and reception of DSSS TDMA digital signals within a frequency band including a predetermined lower limit frequency and a predetermined upper limit frequency, the device comprising a radiofrequency portion comprising:

a frequency generator generating continuously and repetitively at a first predetermined chip-clock rate about one-half the predetermined frequency bandwidth, a first PRDS code having a bit sequence length equal to the product of a first integer and a second integer, each complete sequence of the first code generated over a predetermined time interval, the frequency generator further generating continuously and repetitively at a second predetermined chip-clock rate evenly divisible into the first chip-clock rate by a factor which is a third integer, a second PRDS code having a bit sequence length equal to a fourth integer, each complete sequence of the second code generated over said predetermined time interval, each successive chip of the second PRDS code being in a predetermined one-to-one correspondence with a chip which is the leading chip of the chips comprising successive bits in the first PRDS code and separated by a number of chips equal to a fifth integer, a preselected and identifiable position in the first

PRDS code being permanently aligned with a preselected and identifiable position in the second PRDS code;

a pilot signal transmitter continuously transmitting the second PRDS code at a signal center frequency near a limit frequency of the frequency band; and

a data signal transmitter intermittently transmitting a data-modulated first PRDS code signal at a signal center frequency near the center frequency of the frequency band.

5,488,632

TRANSMISSION AND RECEPTION IN A HOSTILE INTERFERENCE ENVIRONMENT

Arthur G. Mason, Andover, and Jeffrey J. Gledhill, Chandlers Ford, both of, England, assignors to National Transcommunications Limited, Winchester, England

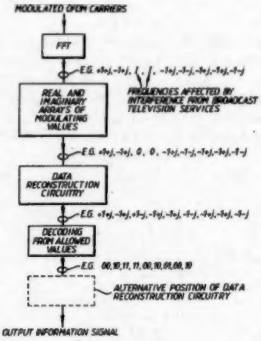
PCT No. PCT/GB91/00513, § 371 Date Oct. 29, 1992, § 102(e) Date Oct. 29, 1992, PCT Pub. No. WO91/15925, PCT Pub. Date Oct. 17, 1991

PCT Filed Apr. 2, 1991, Ser. No. 940,874

Claims priority, application United Kingdom, Mar. 30, 1990, 9007141; Sep. 14, 1990, 9020169; Sep. 14, 1990, 9020170

Int. Cl.[6] H04K *1/10;* **H04L** *27/28*

U.S. Cl. 375—260 **25 Claims**


MODULATED OFDM CARRIERS
FFT
REAL AND IMAGINARY ARRAYS OF MODULATING VALUES
FREQUENCIES AFFECTED BY INTERFERENCE FROM BROADCAST TELEVISION SERVICES
DATA RECONSTRUCTION CIRCUITRY
DECODING FROM ALLOWED VALUES
ALTERNATIVE POSITION OF DATA RECONSTRUCTION CIRCUITRY
OUTPUT INFORMATION SIGNAL

1. Apparatus for receiving an orthogonal frequency division multiplex (OFDM) signal transmitted at low power in a frequency band subject to interference from other transmissions, said OFDM signal comprising a plurality of OFDM carriers modulated by a block of samples, comprising:

means for demodulating the received OFDM carriers so as to produce a block of values representing the block of samples modulating said OFDM carriers;

means for decoding information contained in said sample values, the decoding means excluding from the decoding process sample values demodulated from OFDM carriers at frequencies likely to experience interference from said other transmissions; and

means for outputting said decoded information.

5,488,633

INTERSYMBOL INTERFERENCE CHANNEL CODING SCHEME

Rajiv Laroia, Bridgewater, N.J., assignor to AT&T Corp., Murray Hill, N.J.

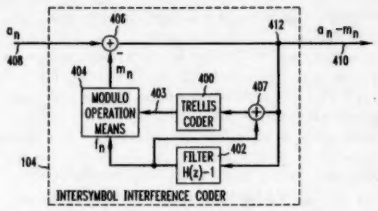
Filed Jun. 14, 1993, Ser. No. 76,603

Int. Cl.[6] H04L *5/12;25/34*

U.S. Cl. 375—262 **17 Claims**

1. A method for transmitting data over an intersymbol interference channel using a predetermined signal-space code, the method comprising the steps of:

receiving a sequence of input signal points (**408**) selected from a predetermined constellation of signal points; and



adding a dither signal to each of the input signal points, the dither signal (**406**) applied to a present signal point being selected as a function of previous signal points in the sequence and the current state of a finite-state machine (**400**) used to generate the signal-space code.

5,488,634

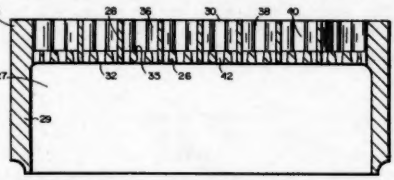
LOWER TIE PLATE DEBRIS CATCHER FOR A NUCLEAR REACTOR

Eric B. Johansson, Wrightsville Beach, N.C.; Robert B. Elkins; Bruce Matzner, both of San Jose, Calif.; Gerald M. Latter, Wilmington, N.C., and Richard A. Proebstle, San Jose, Calif., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 10, 1994, Ser. No. 194,357

Int. Cl.[6] G21C *19/42*

U.S. Cl. 376—313 **16 Claims**



1. In a nuclear fuel assembly, a unitary one-piece lower tie plate grid comprising:

a lower grid portion and an upper grid portion;

means for supporting fuel rods above the lower tie plate grid including said upper and lower grid portions;

said supporting means comprising a plurality of laterally spaced cylindrical bosses having apertures extending therethrough and cylindrical boss portions extending upwardly from said lower grid portion, said bosses being sized for receiving lower ends of the fuel rods in said apertures, said supporting means further including web portions extending upwardly from said lower grid portion and interconnecting said boss portions to define with said boss portions a plurality of flow spaces in said upper grid portion extending from said lower grid portion and opening through an upper surface of said lower tie plate grid;

said boss portions having vertical centerlines arranged at the corners of square matrices with said web portions extending linearly between said boss portions along sides of the square matrices and convex portions of said cylindrical boss portions extending between perpendicularly oriented web portions of each matrix, said web portions and said convex portions defining side walls of the flow spaces;

said lower grid portion of said lower tie plate grid including a plurality of openings extending therethrough and opening into said flow spaces for separating debris from a coolant flowing through said lower grid portion into said flow spaces between said boss and said web portions.

5,488,635

LOW COMPLEXITY ADAPTIVE EQUALIZER RADIO RECEIVER EMPLOYING REDUCED COMPLEXITY BRANCH METRIC CALCULATION

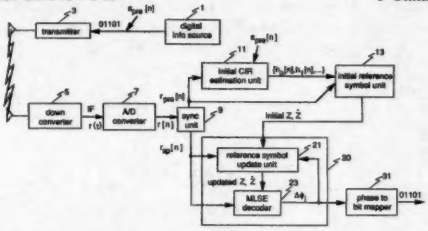
Sandeep Chennakeshu, Schenectady; Ravinder D. Koilpillai, and Raymond L. Toy, both of Latham, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 29, 1993, Ser. No. 143,027

The portion of the term of this patent subsequent to Dec. 6, 2011, has been disclaimed.

Int. Cl.[6] H03D *1/00*; H04L *27/06*

U.S. Cl. 375—340 **3 Claims**



1. A method for demodulating at a receiver, a transmitted message intended for a user, the transmitted message comprised of message symbols transmitted with synchronization ("sync") symbols, being the same as sync symbols prestored in the receiver, differentially encoded in phases and amplitudes of a radiowave signal transmitted as symbol s from an even symbol constellation during even symbol periods, and as § from an odd symbol constellation during odd symbol periods, comprising the steps of:

a) sensing the phases and amplitudes of the radiowave signal at a down converter;

b) digitizing the sensed phases and amplitudes into received samples at an analog to digital (A/D) converter;

c) extracting received message samples at a sync unit;

d) calculating estimated received symbol constellation {Z} comprised of estimated received symbols Z_{ji} which is an estimate of a symbol s_i being transmitted during even time periods through a channel with intersymbol interference from a previously transmitted symbol $§_j$ at an initial reference symbol unit;

e) calculating estimated received symbol constellation $\{\hat{Z}\}$ comprised of estimated received symbols $\hat{Z}_{ji}$ which is an estimate of a symbol s_i being transmitted during odd time periods through a channel with intersymbol interference from a previously transmitted symbol s_j at an initial reference symbol unit;

f) determining a set of reference constellation points $\{Z^{ref}\}$ and $\{\hat{Z}^{ref}\}$ being a subset of estimated received symbol constellations {Z}, $\{\hat{Z}\}$ that when rotated, provide received symbol constellations {Z}, $\{\hat{Z}\}$;

g) determining a demodulated symbol sequence at a MLSE decoder which would minimize a total deviation, being a sum of branch metrics, d_{ji}, each branch metric, d_{ji}, being a deviation from a received message sample to a closest estimated symbol constellation point Z_{ij}, $\hat{Z}_{ji}$ and is calculated from reference constellation points $\{Z^{ref}\}$ and $\{\hat{Z}^{ref}\}$ for even and odd symbol periods, respectively;

h) adjusting the estimated symbol constellation points Z_{ji}, $\hat{Z}_{ji}$ to compensate for a change in the channel over time at a reference symbol update unit;

i) converting the demodulated symbol sequence to a bit sequence at an output means;

j) creating a message from the bit sequence; and

k) providing the message to said user.

5,488,636

DIGITAL DATA DETECTOR

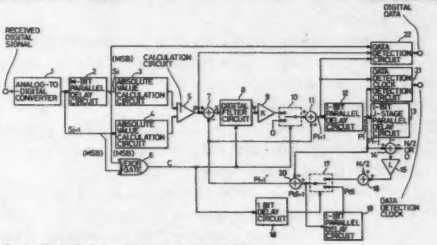
Eiji Yamada, Tenri, and Hitoshi Takeuchi, Kitakatsuragi, both of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 28, 1994, Ser. No. 266,755

Claims priority, application Japan, Jun. 30, 1993, 5-162032

Int. Cl.[6] H03D *1/00*

U.S. Cl. 375—340 **12 Claims**



1. A digital data detector comprising:

a sampler for sampling a received digital signal at a constant frequency higher than a channel bit rate;

a phase interval calculator connected to receive an output of said sampler, for calculating a phase interval from a point where said received digital signal crosses a reference level to a current sampling point from the sampler;

a reference level crossing detector, connected to receive an output of the sampler, for outputting a cross detection signal when the received digital signal between the current sampling point and a previous sampling point located one point before the current sampling point crosses the reference level;

a phase predictor for calculating a predicted phase of the current sampling point based on a phase of the prior sampling point, a phase of a sampling point located at least two points before the current sampling point, and the cross detection signal;

an error calculator for calculating a predicted error between the calculated phase interval and the predicted current phase,

a band limiter for limiting a frequency band of said predicted error in response to said cross detection signal,

a phase calculator for calculating a phase of the current sampling point according to said band limited predicted error, said predicted current phase, and said cross detection signal,

a clock detector for detecting a data detection clock signal in synchronization with received digital signal according to a phase of each sampling point calculated by said phase calculator, and

a data detector for detecting digital data from said received digital signal according to the calculated phase interval, the calculated current phase and the sampling data, the calculated current phase and the sampling data.

5,488,637

DECODING METHOD AND APPARATUS HAVING OPTIMUM DECODING PATHS

Jechang Jeong, Seoul, and Hyunsoo Shin, Suwon, both of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

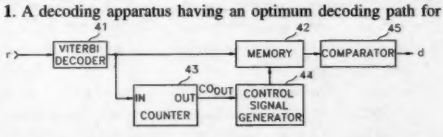
Filed Mar. 28, 1994, Ser. No. 219,293

Claims priority, application Rep. of Korea, Mar. 26, 1993, 93-4815

Int. Cl.[6] H04L *27/06*

U.S. Cl. 375—341 **18 Claims**

1. A decoding apparatus having an optimum decoding path for



use in a digital communication apparatus which decodes a code sequence constituting symbols, said decoding apparatus comprising:

a decoder for decoding the symbols within a window formed in units representing a decoding depth after receiving the code sequence to generate decoded data, and for relocating the window on the code sequence by a predetermined movement distance whenever the decoding with respect to the window is completed;

memory means for storing the decoded data supplied from the decoder and for providing respective stored decoded data in response to respective address signals;

control means for receiving the decoded data from the decoder and generating respective said address signals permitting reproduction of said stored decoded data corresponding to an identical symbol from the memory means; and

means for outputting the stored decoded data having the highest frequency of occurrence among the decoded data corresponding to the identical symbol received from the memory means.

5,488,638

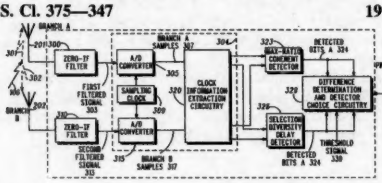
CLOCK RECOVERY METHOD AND APPARATUS IN A DIVERSITY RECEIVER

Henry L. Kazecki, Arlington Heights, and John W. Diehl, Glen Ellyn, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 844,084, Mar. 2, 1992, abandoned. This application Feb. 22, 1994, Ser. No. 198,662

Int. Cl.[6] H04B *7/10*; H04L *1/02*

U.S. Cl. 375—347 **19 Claims**



4. A receiver utilized in a radiotelephone, the receiver receiving a signal transmitted from a source, the signal having both clock information and data, the clock information to be used by the receiver for detection of the data, the receiver comprising:

means for filtering the received signal;

mean, coupled to said means for filtering, for converting said filtered received signal into a plurality of samples, including both the clock information and data;

means, coupled to said means for converting, for extracting the clock information from said plurality of samples;

at least a first, max-ratio coherent, data detector and a second, selection diversity delay, data detector for detecting the data contained in said plurality of samples utilizing said extracted clock information; and

means, coupled to said at least first and second data detectors, for determining a difference in said detected data between said at least first and second data detectors and choosing said detected data from said first data detector or said second date detector when said difference is less than or equal to a predetermined threshold.

5,488,639

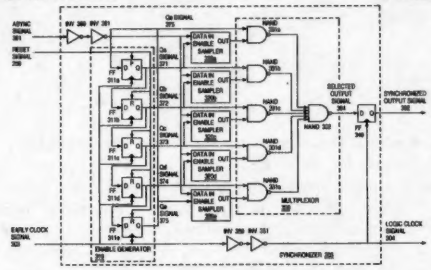
PARALLEL MULTISTAGE SYNCHRONIZATION METHOD AND APPARATUS

Peter D. MacWilliams, Aloha, Oreg.; Dror Avni, Haifa, Israel; Avi Liebermensch, Kfar Vradim, Israel; Anan Baransy, Nazareth, Israel, and Robert L. Farrell, Hillsborough, N.J., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 21, 1993, Ser. No. 171,554

Int. Cl.[6] H04L *7/00*

U.S. Cl. 375—355 **4 Claims**



1. A synchronizing method for synchronizing an asynchronous signal with a clock signal in a synchronizer, said asynchronous signal being asynchronous to said clock signal in both phase and frequency, said synchronizer including an enable generator, a first sampling circuit, a second sampling circuit, a third sampling circuit, a selecting circuit, and a latching circuit, said enable generator coupling to said first sampling circuit via a first enable line, said enable generator coupling to said second sampling circuit via a second enable line, said enable generator coupling to said third sampling circuit via a third enable line, said first, said second and third sampling circuits coupling to receive said asynchronous signal, said selecting circuit coupling to receive output of said first, second and third sampling circuits, said latching circuit coupling to receive the output of said selecting circuit, said synchronizing method comprising the steps of:

said first sampling circuit sampling said asynchronous signal;

generating an output signal for said first sampling circuit;

waiting a first period of time;

at a first time, selecting the output of said first sampling circuit to correspond to a synchronized output;

said second sampling circuit sampling said asynchronous signal;

generating an output signal for said second sampling circuit;

waiting a second period of time;

at a second time, selecting the output of said second sampling circuit to correspond to said synchronized output;

said third sampling circuit sampling said asynchronous signal;

generating an output signal for said third sampling circuit;

waiting a third period of time;

at a third time, selecting the output of said third sampling circuit to correspond to said synchronized output;

said first sampling circuit sampling said asynchronous signal a second time;

generating an output signal for said first sampling circuit a second time;

waiting a fourth period of time; and

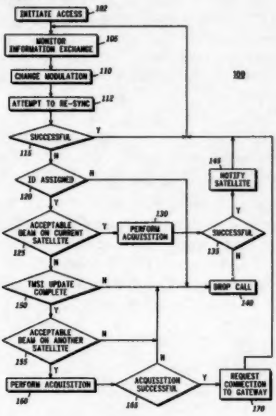
at a fourth time, selecting the output of said first sampling circuit a second time to correspond to said synchronized output.

5,488,640

METHOD AND APPARATUS FOR RE-ESTABLISHMENT OF A COMMUNICATION

James P. Redden, Mesa; David Terris, Phoenix, and Keith A. Olds, Mesa, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 31, 1994, Ser. No. 298,633
Int. Cl.[6] H04L *7/00*
U.S. Cl. 375—357 **14 Claims**



1. A method of re-establishing a communication link between a communication station and a subscriber unit comprising the steps of:

(a) monitoring by said subscriber unit, an information exchange on said communication link to detect a loss of synchronization;

(b) changing by said subscriber unit, a modulation technique of said communication link to re-synchronize said subscriber unit and said communication station when said loss of synchronization is detected;

(c) determining if said subscriber unit has been assigned a subscriber identifier by said communication station; and

(d) performing an acquisition attempt on another antenna beam of said communication station using said subscriber identifier, steps (c) and (d) being performed by said subscriber unit when step (b) fails to re-synchronize.

5,488,641

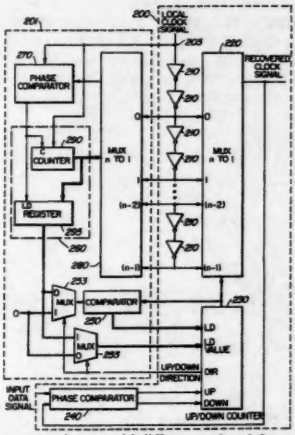
DIGITAL PHASE-LOCKED LOOP CIRCUIT

Oguz Ozkan, Brampton, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Continuation of Ser. No. 988,536, Dec. 10, 1992, abandoned. This application Feb. 9, 1995, Ser. No. 405,171
Int. Cl.[6] H03D *3/24*
U.S. Cl. 375—374 **20 Claims**

1. A phase-locked loop circuit comprising:

a first circuit for generating recovered clock signals each one corresponding to a discrete amount of delay of a local clock signal, the first circuit including a delay line having a predetermined number of delay units n and corresponding taps distributed at substantially equal increments along the length of the delay line, the total delay duration of the delay line being substantially larger than a period of the local clock signal, means for comparing the phase of an input data signal with a last-generated recovered clock signal and for generating a difference signal when a phase difference exists between the input data signal and the last-generated recovered clock signal, and means responsive to the difference signal for selecting a tap of the delay line for the generation of a recovered clock signal, the selecting means including a first



counter responsive to said difference signal from the comparing means for providing tap select control signals and a first multiplexer responsive to the tap select control signals and connected to the taps of the delay line to provide the recovered clock signal from a tap selected in accordance with the tap select control signals;

means responsive to the local clock signal and to signals from respective taps of the delay line for measuring the smallest quantity of delay units required to provide at least a 360 degree phase shift of the local clock signal and for generating a corresponding output signal; and

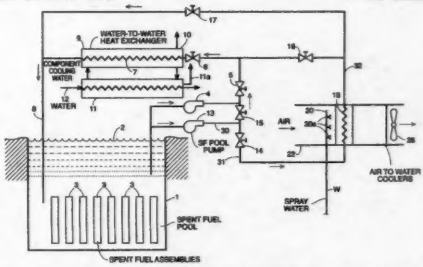
means responsive to the output signal generated by the measuring means for limiting the first counter to a count corresponding to the measured quantity of delay units.

5,488,642

COOLING SYSTEM FOR SPENT FUEL POOL

Paul Malik, Northport; Robert Kosson, Massapequa, both of N.Y.; Michael Vasely, 21 Newhard Pl., Hopewell Junction, N.Y. 12533, and George Stegmann, Thornwood, N.Y., assignors to Consolidated Edison Company of New York, Inc., New York, and Michael Vasely, Hopewell Junction, both of N.Y.

Filed Aug. 22, 1994, Ser. No. 294,072
Int. Cl.[6] G21C *19/07*
U.S. Cl. 376—272 **12 Claims**



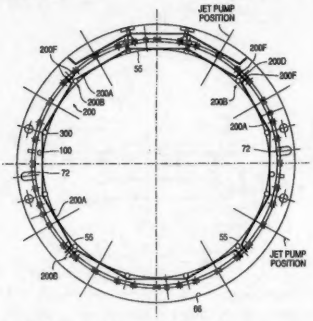
6. In a nuclear power generating plant having a pool of water for cooling spent fuel assemblies and a water to water heat exchanger for maintaining the water in said pool of water at a desired cooling temperature, an auxiliary heat exchanger which employs a stream of air carrying a mist of fine water droplets as a coolant medium for indirect heat exchange with water circulated through said auxiliary heat exchanger from said pool of cooling water.

5,488,643

METHOD AND APPARATUS FOR SUPPORTING A SHROUD IN A NUCLEAR REACTOR

Bengt I. Baversten, Weatogue, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 11, 1994, Ser. No. 241,441
Int. Cl.[6] G21C *19/28*
U.S. Cl. 376—390 **3 Claims**



1. A method of supporting a shroud in a pressure vessel of a nuclear reactor comprising the steps of:

suspending a plurality of upper hanger rods on a structure disposed in said pressure vessel above the level at which said shroud is suspended;

connecting the plurality of upper hanger rods to a multi-segment ring member which is disposed about said shroud by arranging hooks which are provided on the lower end of said upper hanger rods to engage with the ring member so that when said ring member is tightened portions of said hooks are pressed into engagement with said shroud; and

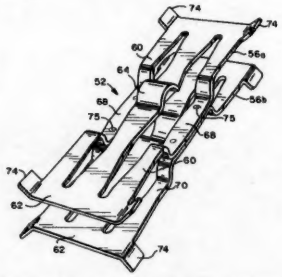
tightening said ring member to clamp said portions of said hooks against said shroud.

5,488,644

SPRING ASSEMBLIES FOR ADJOINING NUCLEAR FUEL ROD CONTAINING FERRULES AND A SPACER FORMED OF THE SPRING ASSEMBLIES AND FERRULES

Eric B. Johansson, Wrightsville Beach, N.C., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 13, 1994, Ser. No. 274,516
Int. Cl.[6] G21C *3/34*
U.S. Cl. 376—441 **15 Claims**



1. A spring assembly for location between a pair of adjacent ferrules in a nuclear fuel bundle having a plurality of nuclear fuel rods passing through the ferrules and biasing the fuel rods of adjacent ferrules against stops in the ferrules, the spring assembly in an unstressed condition, comprising:

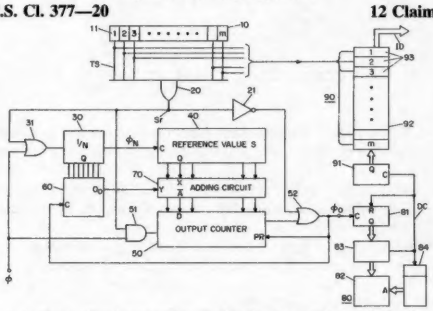
first and second spring bodies lying in respective planes, each spring body having a central leaf, a pair of outer leaves spaced from said central leaf, and an end portion at each of opposite ends of said spring body joining ends of said central and outer leaves, said central leaf of each spring body having an intermediate portion projecting forwardly of the plane of said spring body to a fuel rod contacting forward side of said plane, said pair of outer leaves of each spring body having intermediate portions projecting rearwardly of the plane of said spring body, said spring bodies being disposed in back-to-back relation to one another with said intermediate portions of said outer leaves engaging one another, said planes lying parallel to and spaced from one another and said end portions lying in registration with one another whereby said intermediate portions of said central leaves project to opposite sides of said assembly for engagement with fuel rods in next-adjacent ferrules.

5,488,645

CLOCK SIGNAL GENERATING DEVICE

Kenichi Mori, and Shotaro Yokoyama, both of Nagano, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 10, 1995, Ser. No. 402,030
Claims priority, application Japan, Mar. 10, 1994, 6-038926
Int. Cl.[6] H03K *3/02;21/40*
U.S. Cl. 377—20 **12 Claims**



1. A clock signal generating device for generating a clock signal for chopping periods of time represented by a plurality of time signals, comprising:

a reference time detecting means for detecting a reference time from the time signals and for outputting a reference signal;

a frequency divide-and-counting means operatively coupled to the reference time detecting means, for counting a reference clock signal until the reference signal is generated and for outputting a divided clock signal obtained by dividing the reference clock signal with a predetermined frequency dividing ratio;

a reference value counting means operatively coupled to the frequency divide-and-counting means, for counting the divided clock signal and for storing a count value of the divided clock signal as a reference value;

an output counting means operatively coupled to the reference value counting means, for receiving the reference clock signal after the reference signal is generated, for counting the received reference clock signal, and for generating an output clock signal each time a count value of the received reference clock signal reaches a set value thereof;

an accumulating means operatively coupled to the output counting means, for accumulating, each time the output clock signal is generated, a count value of the reference clock signal of the frequency divide-and-counting means at a time of generation of the reference signal; and

a set value renewing means operatively coupled to the output counting means, for renewing the set value of the output counting means to the reference value stored in the reference value counting means each time the output clock signal is generated, and for renewing the set value of the output counting means to a value obtained by adding 1 to a multiple of a set parameter of the frequency dividing ratio only when an

accumulated value of the accumulating means reaches the multiple of the set parameter.

5,488,646

CLOCK DIVIDER

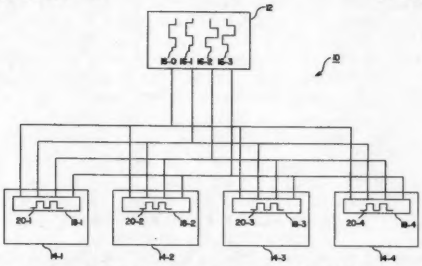
Anthony M. Jones, Bristol, and David A. Barnes, Gloucestershire, both of, United Kingdom, assignors to Discovision Associates, Irvine, Calif.

Filed Mar. 23, 1995, Ser. No. 409,108

Claims priority, application United Kingdom, Mar. 24, 1994, 9405806

Int. Cl.[6] H03K *21/02;21/10;3/78*

U.S. Cl. 377—47 **4 Claims**



1. A counter clocked by a L phase system clock of frequency f, counting an integer number N, comprising:

L means for counting (N-D), where D is a predetermined integer number that allows each L counter means to settle before N would be counted, each counting means being clocked by a predetermined phase of system clock;

L means for controlling counter means, one counter controlling means associated with each counter means, for delaying the output of their associated counter by at least D; and

a means for implementing a logic OR;

wherein:

the L counter means and their associated counter control means are arranged in series such that the input to each counter means is the output of the previous counter means in series delayed by the counter control means associated with the previous counter means; and

the outputs of each counter means are delayed by their associated counter control means, then are inputs to the OR means, which ORs the outputs to form the output of the counter.

5,488,647

Patent Not Issued For This Number

5,488,648

BEHAVIOR MONITORING AND ANALYZING SYSTEM FOR STORED PROGRAM CONTROLLED SWITCHING SYSTEM

Brian R. Womble, Bedford, Tex., assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

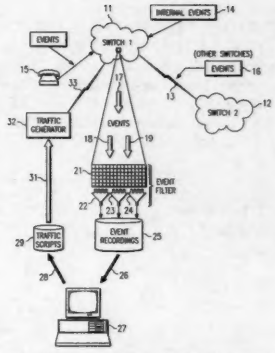
Filed Aug. 17, 1993, Ser. No. 107,965

Int. Cl.[6] H04M *1/24;3/08;3/22;* **H04J** *1/16*

U.S. Cl. 375—13 **26 Claims**

1. A method of monitoring a telecommunication switch having internal events communicated between interacting, event driven blocks of software executed to control operation of the telecommunication switch, said method comprising the steps of:

defining the internal events desired to be monitored and parameters associated with the internal events desired to be monitored;



detecting internal events communicated between the blocks of software of said telecommunication switch;

filtering said detected internal events using said defined parameters associated with the defined internal events desired to be monitored; and

recording the filtered, detected internal events and associated parameters.

5,488,649

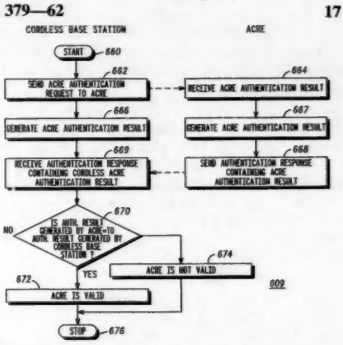
METHOD FOR VALIDATING A COMMUNICATION LINK

Michael J. Schellinger, Vernon Hills, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 6, 1994, Ser. No. 239,012

Int. Cl.[6] H04Q *7/34*

U.S. Cl. 379—62 **17 Claims**



15. A method for authenticating authorization equipment operating in a communication system having a cordless base station coupled to a telephone network, said cordless base station having an identification code associated therewith, the method comprising the steps of:

transmitting an authentication request from said cordless base station to said authorization equipment, said authentication request including a random number generated at said cordless base station and a first identification number;

generating a first authentication result at said cordless base station, said first authentication result being based upon said random number and said first identification number;

generating a second authentication result at said authorization equipment based upon said random number and said cordless base station identification code;

transmitting said second authentication result to said cordless base station; and

comparing said first authentication result and said second authentication result to authenticate said authentication equipment.

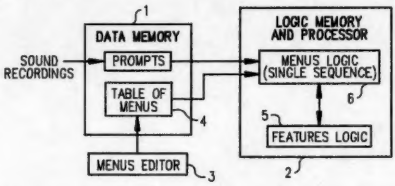
5,488,650
CONFIGURABLE TELEPHONE INTERFACE FOR ELECTRONIC DEVICES

Robert C. Greco, and Brian J. Gore, both of Seattle, Wash., assignors to Active Voice Corporation, Seattle, Wash.

Continuation-in-part of Ser. No. 764,628, Sep. 24, 1991, abandoned. This application Sep. 4, 1992, Ser. No. 940,614

Int. Cl.[6] H04M *1/32*

U.S. Cl. 379—67 **22 Claims**



1. A method for communication between a user using a telephone and an electronic logic device, which device includes a table of menus containing a plurality of menus, each of which contains data and not logic instructions, and a logic memory and processor containing logic steps executed by the processor upon invocation of each menu, each menu including specification of actions to be taken by the processor upon receipt of any of a plurality of possible inputs, comprising:

including in the logic steps which are executed upon invocation of a menu a play prompt step and a get response step; and,

when the menu is invoked, executing both the play prompt step and the get response step before proceeding to another menu from the table of menus.

5,488,651
FAX MESSAGE SYSTEM

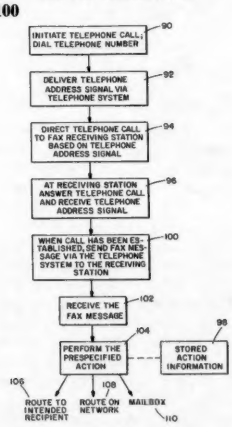
Eric R. Giler, Wellesley Hills, and David W. Duehren, Needham, both of Mass., assignors to Brooktrout Technology, Inc., Needham, Mass.

Continuation-in-part of Ser. No. 721,915, Jun. 20, 1991, Pat. No. 5,291,546, which is a continuation of Ser. No. 348,592, May 8, 1989, abandoned. This application Feb. 28, 1994, Ser. No. 203,658

The portion of the term of this patent subsequent to Mar. 1, 2011, has been disclaimed.

Int. Cl.[6] H04M *11/00*

U.S. Cl. 379—100 **6 Claims**



1. A method for causing information including at least a fax message sent via a telephone system to be routed through a multinode computer network between a telephone receiving station and a prespecified network location, the method comprising:

initiating a telephone call via the telephone system to the receiving station by dialing a telephone number enabling the telephone call to be routed through a telephone network to the receiving station which is coupled to the telephone system and the computer network, said telephone number also being sufficient to indicate a computer network location;

passing said telephone number through the telephone system in the form of a telephone address signal as part of the call initiation process by which a telephone connection to the receiving station is established;

directing the telephone call being initiated to the receiving station, based on the telephone address signal;

answering the telephone call at the receiving station, and receiving at the receiving station at least part of the telephone address signal;

storing computer network location information which associates computer network locations with telephone address signals; and

when the connection has been established, sending a fax message between the receiving station and the computer network location based on the telephone address signal.

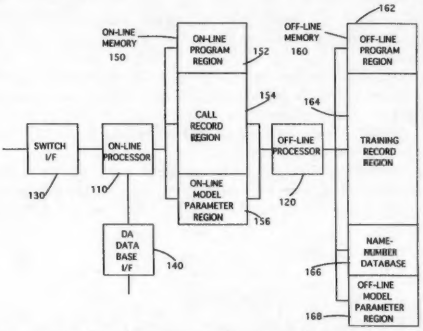
5,488,652
METHOD AND APPARATUS FOR TRAINING SPEECH RECOGNITION ALGORITHMS FOR DIRECTORY ASSISTANCE APPLICATIONS

Gregory J. Bielby, Pointe Claire; Vishwa N. Gupta, Brossard; Lauren C. Hodgson, Beaconsfield; Matthew Lennig; R. Douglas Sharp, both of Westmount, and Hans A. Wasmeier, Ottawa, all of, Canada, assignors to Northern Telecom Limited, Canada

Filed Apr. 14, 1994, Ser. No. 227,830

Int. Cl.[6] H04M *3/42*

U.S. Cl. 379—88 **31 Claims**



2. A method for performing a telephone directory assistance function, comprising:

for each of a plurality of callers:

prompting the caller to speak a name associated with a desired directory listing;

receiving a speech signal from the caller;

applying a speech recognition algorithm to the received speech signal to recognize a name in a name vocabulary as corresponding to the received speech signal;

determining a telephone number desired by the caller using the recognized name;

releasing the desired telephone number to the caller; and

creating a call record comprising the released telephone number and a stored representation of the speech signal to associate the stored representation of the speech signal with the released telephone number;

processing according to a parameter modification algorithm a plurality of the call records to modify parameters of the speech recognition algorithm, said processing comprising:

processing each of the call records by:

deriving a plurality of name candidates from the released telephone number;

for each name candidate, calculating a measure of probability that the name candidate corresponds to the stored representation of the speech signal;

identifying a best name candidate having the highest measure of probability of the plurality of name candidates;

applying acceptance criteria based on the calculated measures of probability and, in response to the acceptance criteria being met, creating a training record comprising the stored representation of the speech signal and the best candidate name; and

processing the training records according to a training algorithm to modify the parameters of the speech recognition algorithm by, for each name of the name vocabulary:

accumulating statistics for said name derived from plural training records containing said name as a best name candidate; and

recalculating parameters associated with said name by the speech recognition algorithm from the statistics accumulated for said name; and

employing the speech recognition algorithm to recognize names spoken by callers in directory assistance calls received subsequent to modification of the parameters of the speech recognition algorithm.

5,488,653

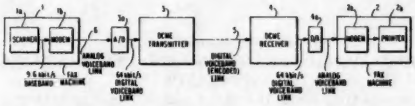
FACSIMILE INTERFACE UNIT (FIU) ENHANCED CAPABILITIES NEGOTIATION

Spiros Dimolitsas, Gaithersburg; Michael Onufry, Jr., Clarksburg, and Jack H. Rieser, Middletown, all of Md., assignors to Comsat Corporation, Bethesda, Md.

Continuation-in-part of Ser. No. 754,785, Sep. 4, 1991. This application Aug. 27, 1992, Ser. No. 935,787

Int. Cl.[6] H04M *11/00*

U.S. Cl. 379—100 **9 Claims**



1. A facsimile communication system comprising:

a first facsimile device for providing an analogue voiceband facsimile signal;

a first processing circuit, connected to receive the facsimile signal from said first facsimile device, for converting the analogue voiceband facsimile signal into a digital code signal representing information carried in the analogue voiceband signal, and for transmitting the digital code signal, and for detecting a type of facsimile signal provided by said first facsimile device and assembling an identification packet containing information identifying the type thus detected, said first processing circuit transmitting the identification packet in-band prior to transmitting the digital code signal;

a second processing circuit, connected to receive the transmitted digital code signal from said first processing circuit, for converting the received digital code signal into an analogue voiceband facsimile signal; and

a second facsimile device, connected to receive the analogue voiceband facsimile signal from the second processing circuit, for providing a responsive analogue voiceband facsimile signal;

wherein said second processing circuit detects a type of responsive facsimile signal provided by said second facsimile device and assembles a responsive identification packet containing information identifying the type of signal thus detected, and transmitting the responsive identification packet in-band prior to transmitting the digital code signal, said responsive identification packet including regarding capabilities of said second processing circuit.

5,488,654

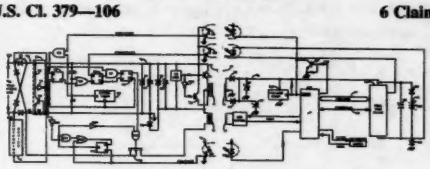
TELEMETRY DEVICE INCLUDING A DYNAMIC OFF-HOOK DETECTOR CAPABLE OF OPERATIONG IN A PULSE-DIALING ENVIRONMENT

Stewart W. Oliver, Venice, Calif., assignor to Telegenics, Inc., Los Angeles, Calif.

Filed Sep. 29, 1993, Ser. No. 128,864

Int. Cl.[6] H04M *11/00*

U.S. Cl. 379—106 **6 Claims**



1. A method of operating a telemetry device coupled to a phone line at a remote location, said telemetry device residing in a static state until said telemetric device enters an active state to seize said phone line to transmit data back to a central station over said phone line, said telemetry device including a static off-hook detector for determining when a contending device seizes said phone line while said telemetry device is in said static state, said method comprising the steps of:

pulse dialing by said telemetry device over said phone line to generate a dial pulse signal with alternating on-hook portions and off-hook portions when said telemetry device enters said active state;

monitoring said static off-hook detector during said on-hook portions of said dial pulse signal to determine if the contending device goes off-hook and seizes said phone line, and

disengaging said telemetry device from said phone line during said pulse dialing if in said monitoring step a determination was made that the contending device is seizing said phone line during an on-hook portion of said dial pulse signal.

5,488,655

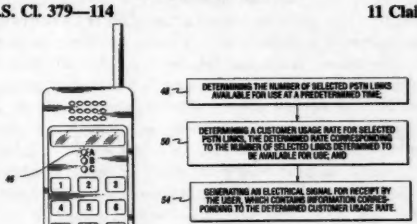
METHOD AND SYSTEM FOR CONTROLLING TRAFFIC IN PSTN LINKS THROUGH THE USE OF VARIABLE PRICE INCENTIVES

Glen A. Hamlen, Denver, Colo., assignor to U S WEST Technologies, Inc., Boulder, Colo.

Filed Jul. 6, 1994, Ser. No. 271,332

Int. Cl.[6] H04M *15/00*

U.S. Cl. 379—114 **11 Claims**



1. A preemptive method of controlling prospective customer telephone usage in selected PSTN links of the Public Switched Telephone Network (PSTN) through the use of variable price incentives, comprising:

determining on a substantially continuous real-time basis the number of said selected PSTN links which are available for use at a selected time;

determining on a real-time basis a customer usage rate for said selected PSTN links, said determined customer usage rate corresponding to the number of said selected links determined to be available for use at a selected time;

transmitting to a customer an electrical signal containing information corresponding to said determined customer usage rate; and

displaying to said customer said information corresponding to said determined customer usage rate in response to said electrical signal.

5,488,656

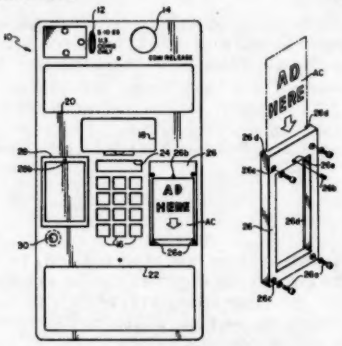
FACE PLATE WITH AD FRAMES FOR COIN OPERATED TELEPHONE BOXES

James R. DeArkland, 8119 Buena Fortuna, Carpinteria, Calif. 93013

Filed Mar. 15, 1994, Ser. No. 212,917

Int. Cl.[6] H04M *17/00;1/00;* **G09F** *3/00;15/00*

U.S. Cl. 379—155 **6 Claims**



4. In a coin operated telephone unit having: a principal section defined by an outer face plate including a coin payment slot, an opening for a coin return mechanism, a dialing key pad area having openings for a set of dialing keys, an opening for the mounting of a telephone handset cradle, and openings for dialing information panels; and a second section containing a locked compartment within which coins are stored, and a return coin unit including a top pivoted front coin return door: an improved outer face plate for the principal section of said coin operated telephone unit including two external rectangular frame members affixed to said face plate with each of said frame members located on one side of the dialing key pad area of said plate, said frame members defining through their peripheries framed panel areas, said frame members being each defined by vertical side legs and horizontal upper and lower legs and having a peripheral rear ridge portion extending along both of said side legs and said lower leg for positioning said frames in spaced relationship with respect to said plate and for supporting therein advertising display cards which are interchangeably insertable into said frames between said upper legs thereof and said plate, and said upper legs of said frame members being provided with security screw meads to maintain said advertising display cards within said frames.

5,488,657

APPARATUS FOR AND METHOD OF OPERATING AN AUTOMATIC LOG ON/LOG OFF CIRCUIT IN A TELEPHONE SYSTEM BY DISCONNECTING A HEADSET

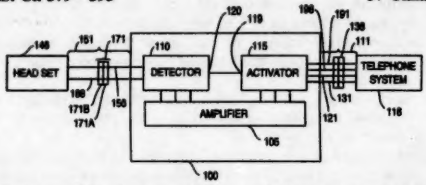
Dwight D. Lynn; Kirk A. Reid, and Shu-Ren Chen, all of Santa Cruz, Calif., assignors to ACS Communications, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 844,739, Mar. 2, 1992, Pat. No. 5,226,077. This application May 11, 1993, Ser. No. 62,614

The portion of the term of this patent subsequent to Jul. 6, 2000, has been disclaimed.

Int. Cl.[6] H04M *1/00*

U.S. Cl. 379—395 **37 Claims**



1. An amplifier for connection to a telephone system, the telephone system including a means for monitoring when a peripheral device is connected thereto, the monitoring means operating to detect a change in a parameter which occurs when the peripheral device is disconnected from the telephone system, the amplifier also being connectable to a telephone headset, and passing signals between the telephone headset and the telephone system, the amplifier comprising:

detecting means for detecting when the headset is disconnected from the amplifier and for generating an output signal in response thereto; and

activating means, operating in response to the output signal, for changing the parameter in a manner that emulates the disconnection of a peripheral device from the telephone system, even though the amplifier remains connected.

5,488,658

VIDEO SIGNAL SCRAMBLING AND DESCRAMBLING APPARATUS

Masayoshi Hirashima, Ibaraki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

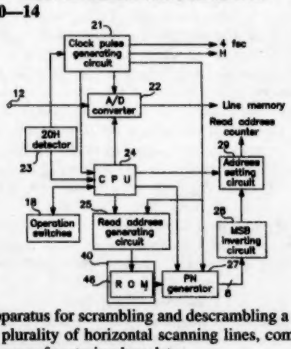
Filed Apr. 15, 1994, Ser. No. 228,220

Claims priority, application Japan, Apr. 15, 1993, 5-113804

The portion of the term of this patent subsequent to Oct. 11, 2011, has been disclaimed.

Int. Cl.[6] H04N *7/167;* **H04L** *9/02*

U.S. Cl. 380—14 **23 Claims**



14. An apparatus for scrambling and descrambling a video signal including a plurality of horizontal scanning lines, comprising:

a first memory for storing key data,

a second memory for storing a reloadable code number which includes a plurality of digits,

a plurality of line memories, each for storing respective ones of said plurality of horizontal scanning lines,

a PN generator, initialized by said key data stored in said first memory and said reloadable code number stored in said second memory, for generating a respective pseudo-random pulse signal for each one of said plurality of horizontal scanning lines,

an address setting circuit for scrambling and descrambling, said address setting circuit set to an initial value corresponding to an output of the PN generator during scrambling, and set to a further initial value which corresponds to a maximum address value of the plurality of line memories minus a further output of the PN generator during descrambling, and

an address counter for generating a plurality of consecutive address values beginning at one of said initial value and said further initial value, and for applying each one of said plurality of consecutive address values respectively to each one of said plurality of line memories for each horizontal scanning line.

5,488,659

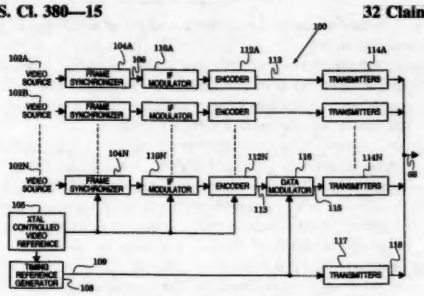
ENCRYPTION/DECRYPTION PROCESS AND APPARATUS FOR A MULTICHANNEL TELEVISION SYSTEM

Pablo Militani, Westlake Village, Calif., assignor to California Amplifier, Camarillo, Calif.

Continuation-in-part of Ser. No. 89,941, Jul. 12, 1993, abandoned. This application Oct. 28, 1994, Ser. No. 331,054

Int. Cl.[6] H04N *7/171*

U.S. Cl. 380—15 **32 Claims**



1. A method of distributing multiple video signals, each produced by a different video source at a system headend and each containing picture and synchronization components, to a plurality of subscriber sites located remote from said headend, said method comprising the steps of:

generating at said headend multiple carrier signals;

modulating at said headend each of said carrier signals with a different one of said video signals to form multiple channel signals, all of said channel signals having their respective video signal synchronization components in time coincidence;

generating a common timing reference signal synchronous with said time coincident synchronization components;

causing each of said channel signals to be encrypted at said headend in accordance with a common predetermined encoding rule;

modulating a selected encrypted channel signal in response to said common timing reference signal;

distributing said multiple encrypted channel signals from said headend to said subscriber sites as a common RF signal; and

responding at each subscriber site to said common timing reference signal to simultaneously decrypt all of the channel signals distributed thereto by operating upon said common RF signal with a single downconverter/decoder in accordance with the inverse of said encoding rule to recover multiple decrypted channel signals for direct simultaneous application to a conventional television receiver.

5,488,660

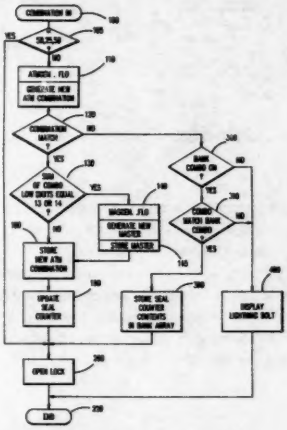
ELECTRONIC COMBINATION LOCK UTILIZING A ONE-TIME USE COMBINATION

Gerald L. Dawson, Lexington, and Daniel L. Thompson, Paris, both of Ky., assignors to Mas-Hamilton Group, Lexington, Ky.

Continuation of Ser. No. 139,450, Oct. 20, 1993, abandoned. This application Apr. 3, 1995, Ser. No. 416,455

Int. Cl.[6] H04K *1/00;* **H04L** *9/00;* **G06F** *7/04;* **E05B** *49/00*

U.S. Cl. 380—24 **19 Claims**



1. An electronic combination lock comprising:

an input dial for inputting numbers of a combination into said lock;

a display for displaying numbers;

an electronic control means for receiving said numbers of said combinations and for comparing said numbers with numbers of an authorized combination;

said electronic control means including:

an encrypting combination generator responsive to an entered combination for encrypting predetermined data and for generating a combination derived from said predetermined data;

a comparator for comparing said entered combination with said generated combination and responsive to a compare equal to generate a signal permitting said lock to open,

said encrypting and generating means responsive to a last accepted combination, a parameter unique to said lock, a master combination, a variable value, said variable value changed in a predictable manner upon each opening of said lock to form a result and manipulation of said result, to generate said authorized combination.

5,488,661

DATA COMMUNICATION SYSTEM AND METHOD WITH DATA SCRAMBLING

Mitsuru Matsui, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 895,629, Jun. 9, 1992, Pat. No. 5,261,003. This application Sep. 22, 1993, Ser. No. 125,131

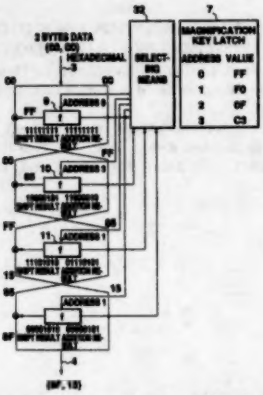
Claims priority, application Japan, Jun. 13, 1991, 3-141911

Int. Cl.[5] H04L *9/06*

U.S. Cl. 380—29 **17 Claims**

3. A data communication method with a data scrambling of a bit array configuration of a digital data array of an input plain text according to a predetermined conversion rule, comprising the steps of:

selecting one of cipher keys as a function of at least part of the input digital data array; and



performing a scramble processing by applying input digital data and the selected cipher key to a scramble function selected from a plurality of scramble functions;

wherein a plurality of the scramble processing means are connected in series, and the cipher key of the scramble processing on and after a second step is selected from a plurality of cipher keys recorded by using a part of data of a scramble output at a previous step.

5,488,662

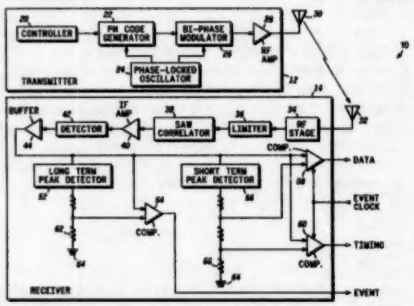
SYSTEM AND METHOD FOR IDENTIFYING AN ARRIVAL TIME OF A COMMUNICATED SIGNAL

Thomas M. Fox, Gilbert; Neal R. Anderson, Mesa, and Julius A. Heeren, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 10, 1994, Ser. No. 209,657

Int. Cl.[6] H04K *1/10*

U.S. Cl. 380—34 **19 Claims**



1. An apparatus for identifying an arrival time of a communicated signal which conveys a message having a plurality of bits of data, said apparatus comprising:

a correlator adapted said communicated signal with a PN sequence and to generate a correlation signal;

means, coupled to said correlator, for detecting the occurrence of a first bit of said message; and

means, coupled to said detecting means and to said correlator, for determining when, after said first bit, said correlation signal corresponds to a threshold, wherein said determining means comprises a comparison circuit which is disabled during said first bit.

5,488,663

ENCODING METHODS FOR GENERATING A DIGITAL SIGNAL CONTAINING MODULATED BIT ALLOCATION INFORMATION, AND RECORD CARRIERS CONTAINING THAT SIGNAL

Jan Dewolf; Gerardus C. P. Lokhoff, and Abraham Hoogendoorn, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

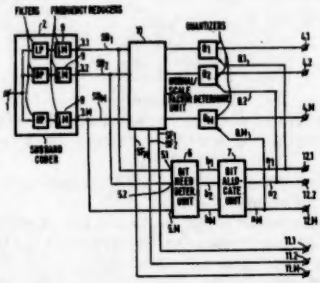
Continuation of Ser. No. 11,938, Feb. 1, 1993, Pat. No. 5,375,171. This application Aug. 4, 1994, Ser. No. 285,870

Claims priority, application European Pat. Off., Feb. 3, 1992, 92200298

The portion of the term of this patent subsequent to Dec. 20, 2011, has been disclaimed.

Int. Cl.[6] H04L *9/00*

U.S. Cl. 380—49 **20 Claims**



1. A method of subband encoding a wide-band digital signal, the method comprising:

generating a plurality of subband signal from the wide-band digital signal, each of the subband signals being made up of consecutive signal blocks with each contain a predetermined number of samples of that subband signal;

quantizing the samples in the signal blocks of the subbands signals to produce quantized samples in the signal blocks;

generating bit allocation information denoting how many bits the samples in the signal blocks are to be quantized by;

modulating the bit allocation information or a portion thereof to produce modulated bit allocation information; and

generating a digital transmission signal including the quantized samples and the modulated bit allocation information.

5,488,664

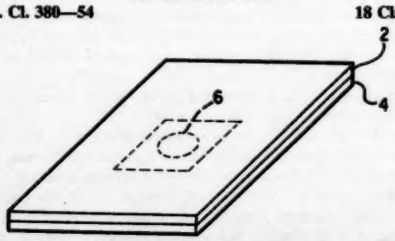
METHOD AND APPARATUS FOR PROTECTING VISUAL INFORMATION WITH PRINTED CRYPTOGRAPHIC WATERMARKS

Adi Shamir, Rehovot, Israel, assignor to Yeda Research and Development Co., Ltd., Rehovot, Israel

Filed Apr. 22, 1994, Ser. No. 231,933

Int. Cl.[6] G09C *5/00*

U.S. Cl. 380—54 **18 Claims**



10. A device for protecting visual information against unauthorized access and modification using a printed cryptographic watermark, the device comprising:

a first sheet of material having a first array of shapes printed thereon, the first sheet of material including the visual information to be protected;

a second sheet of material having a second array of shapes printed thereon, the second sheet of material being transparent so as to form a developer for developing the cryptographic watermark when the second sheet of material is positioned on top of the first sheet of material, the second array of shapes aligned with the first array of shapes so as to display the cryptographic watermark in a superimposed combination of the first and second arrays of shapes when the first sheet of material is viewed through the second sheet of material, wherein the cryptographic watermark is not visible in either one of the first and second sheets when viewed individually.

5,488,665

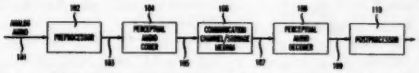
MULTI-CHANNEL PERCEPTUAL AUDIO COMPRESSION SYSTEM WITH ENCODING MODE SWITCHING AMONG MATRIXED CHANNELS

James D. Johnston, Warren, and Deepen Sinha, Chatham, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Nov. 23, 1993, Ser. No. 156,495

Int. Cl.[6] H04N *5/78*

U.S. Cl. 381—2 **36 Claims**



1. A method of perceptually encoding an audio signal comprising a set of input channels, the method comprising the steps of

generating a set of matrixed channels in response to said input channels, and

perceptually encoding said matrixed channels, said perceptually encoding step including selecting noise threshold values based upon noise masking criteria and using said noise threshold values to control the coarseness of quantizing said audio signal during said encoding;

at least an individual one of the matrixed channels of said set of matrixed channels being a function of a) an individual one of said input channels or the sum of, or the difference between, two of them, and b) a prediction of a).

5,488,666

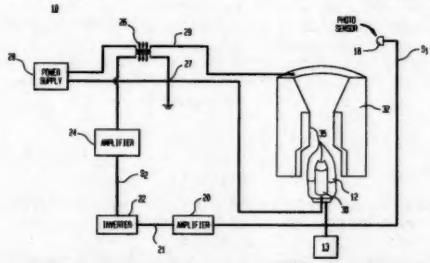
SYSTEM FOR SUPPRESSING SOUND FROM A FLAME

William H. Greenhalgh, Neshanic Station, N.J., assignor to Greenhalgh Technologies, Neshanic Station, N.J.

Filed Oct. 1, 1993, Ser. No. 113,715

Int. Cl.[6] A61F *11/06*

U.S. Cl. 381—71 **14 Claims**



1. A system for suppressing sound produced by a flame comprising:

a photo sensor for detecting fluctuation of said flame for producing a first acoustical signal from said flame, said first acoustical signal having a rate of fluctuation in the range of 20 to 20,000 hertz;

means for producing a second acoustical signal which is inverted in relation to said first acoustical signal; and

an electric arc for applying said second acoustical signal to said flame, said electric arc is modulated by said second acoustical signal to cause a suppression of said sound produced by said flame.

5,488,667

VEHICLE INTERNAL NOISE REDUCTION SYSTEM

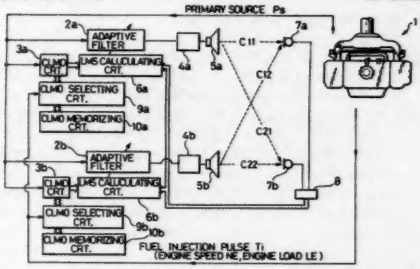
Manpei Tamamura, Ohta; Hiroshi Iidaka, Koganei, and Eiji Shibata, Gunma, all of, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 14, 1994, Ser. No. 180,995

Claims priority, application Japan, Feb. 1, 1993, 5-014927

Int. Cl.[6] G10K *11/16*

U.S. Cl. 387—71 **15 Claims**



1. A vehicle internal noise reduction system for attenuating a vibration noise sound within a passenger compartment by producing a canceling sound from a plurality of speakers, comprising:

operational conditions detecting means for detecting an engine operational condition signal;

canceling signal synthesizing means for synthesizing a vibration noise source signal with a filter coefficient of an adaptive filter into a canceling signal;

canceling sound generating means responsive to said canceling signal for generating a canceling sound from a speaker so as to cancel said vibration noise sounds within the passenger compartment;

error signal detecting means for detecting a state of noise reduction as an error signal;

compensation coefficients determining means for determining a series of compensation coefficients;

compensation coefficients memorizing means for memorizing said series of compensation coefficients;

compensation coefficients selecting means responsive to said engine operational condition signal for selecting a compensation coefficient from within said series of compensation coefficients memorized in said compensation coefficients memorizing means;

input signal compensation means for compensating said vibration noise source signal by said compensation coefficient; and

filter coefficient updating means responsive to an output signal from said input signal compensating means and responsive to said error signal for updating said filter coefficient of said adaptive filter.

5,488,668

MULTIBAND PROGRAMMABLE COMPRESSION SYSTEM

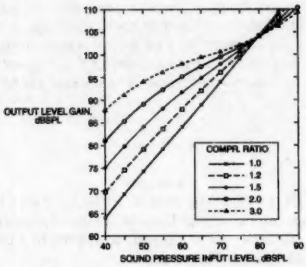
Fred Waldhauer, La Honda, Calif., assignor to ReSound Corporation, Redwood City, Calif.

Division of Ser. No. 723,233, Jun. 28, 1991, Pat. No. 5,278,912. This application Nov. 23, 1993, Ser. No. 156,425

Int. Cl.[6] H04R *25/00*

U.S. Cl. 381—68.4 **3 Claims**

1. A signal compressor for use in a hearing aid, comprising:



variable gain limiter means having an input terminal for receiving an electrical signal which is representative of ambient sounds and an output terminal, said limiter means having a gain which is generally a function of the amplitude of said input electrical signal, which function defines a lower breakpoint:

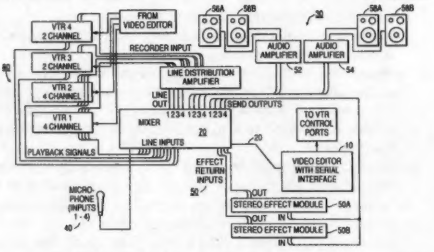
parallel circuit means, connected to said input terminal and said output terminal in parallel to said limiter means for providing a signal at said output terminal generally proportional to said input electrical signal which defines an upper breakpoint, such that the gain curve of said compressor defines a sigmoid function wherein there is a pivot point midway between said upper and lower break points and further wherein the compression ratio of the compressor is substantially the reciprocal of the slope of the gain curve at the pivot point; and

compression control means for varying the compression ratio of the compressor by varying the slope of the gain curve at the pivot point.

5,488,669
MANUAL CROSS FADE LEARN FEATURE FOR AN AUDIO FOLLOW VIDEO MIXER

Michael A. Zampini; Alan Flum, both of Boca Raton; Donald E. Davis, Margate, and Joseph J. Dombrowski, Hollywood, all of Fla., assignors to Sony Corporation, Tokyo, Japan, and Sony Electronics Inc., Park Ridge, N.J.

Filed Oct. 29, 1993, Ser. No. 142,974
Int. Cl.[6] H04B *1/00*
U.S. Cl. 381—119 **11 Claims**



1. An audio follow video mixer for performing a crossfade operation between a first audio channel having a first amplitude and a second audio channel having a second amplitude comprising:

gain control means for adjusting the amplitudes of the first audio channel and the second audio channel, said gain control means including means for manually controlling the adjustment of the amplitude of the first audio channel and the second audio channel and means for providing signals indicating the adjustment made to the first audio channel and the second audio channel;

processor means for receiving said adjustment indicating signals;

memory means for storing data corresponding to said adjustment indicating signals;

a first control member provided on a display portion of said audio follow video mixer, said member being operable to provide a store signal to said processor means to cause said processor means to provide said data corresponding to said adjustment indicating signals to said memory means; and

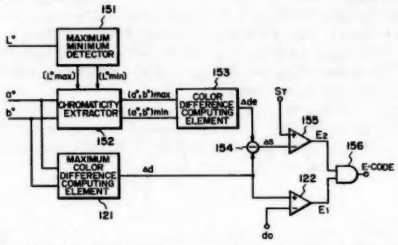
a second control member provided on said display portion operable to cause said processor means to control said gain control means to adjust the amplitudes of the first audio channel and the second audio channel in accordance with said data stored in the memory means;

wherein said first control means and said second control means together comprise a write control member and at least one recall control member, wherein said write control member is operable to arm said processor means to provide said data to said memory means upon operation of said at least one recall control member, and said recall control member is otherwise operable independent of said write control member to cause said processor means to provide said data to said memory means.

5,488,670
COLOR IMAGE PROCESSING METHOD AND APPARATUS

Yoshiyuki Suzuki, Kawasaki, and Masahiro Funada, Yokohama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 877,390, Apr. 30, 1992, abandoned, which is a continuation of Ser. No. 327,002, Mar. 22, 1989, abandoned. This application Dec. 13, 1993, Ser. No. 165,580
Claims priority, application Japan, Mar. 25, 1988, 63-72969
Int. Cl.[6] G06K *9/00*
U.S. Cl. 382—165 **20 Claims**



1. A color image processing method comprising the steps of:

a) providing color image data for a block comprising a plurality of pixels;

b) separating said data into lightness data and chromaticity data for each pixel;

c) discriminating a presence of an edge for each block by using the lightness data without reference to the chromaticity data;

d) deciding whether or not the pixels in the block have a common hue by using the chromaticity data without reference to the lightness data; and

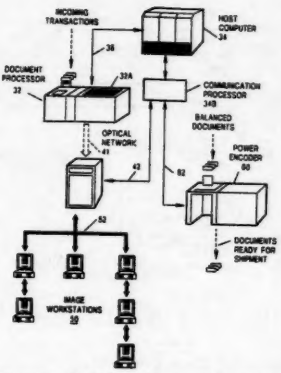
e) judging whether or not the pixels in the block represent a part of a color line image on the basis of the edge discrimination and on the basis of the hue decision.

5,488,671
REDUCING OPERATOR BALANCING IN A DOCUMENT PROCESSING SYSTEM EMPLOYING AUTOMATIC READING

Norman P. Kern, Birmingham, Mich., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Oct. 19, 1990, Ser. No. 600,777
Int. Cl.[6] G06K *9/00*
U.S. Cl. 382—138 **10 Claims**

1. In a transaction processing system, wherein a transaction comprises credit and debit documents which should balance,



wherein said system includes an automatic amount reader for automatically reading document amounts from at least some of said documents, and wherein each amount comprises a plurality of digits at respective digit positions, a method for automatically correcting a document amount which has been incorrectly ready by said automatic amount reader, said method comprising:

providing a first digit choice and a second digit choice for at least one digit position of a document automatically ready by said automatic amount reader, each first digit choice being the one which said automatic amount reader determines as most likely to be correct;

extracting the amount from each document of said transaction which is not automatically read by said automatic amount reader, each extracted amount comprising a plurality of digits at respective digit positions;

determining from the first choice digits and extracted digits of documents making up a transaction whether it is an out-of-balance transaction;

determining a digit position in error for said out-of-balance transaction; and

substituting a second digit choice for the first digit choice of an automatically read document of said out-of-balance transaction at the digit position in error to attempt to automatically balance said out-of-balance transaction.

5,488,672

COLOR IMAGE PROCESSING APPARATUS

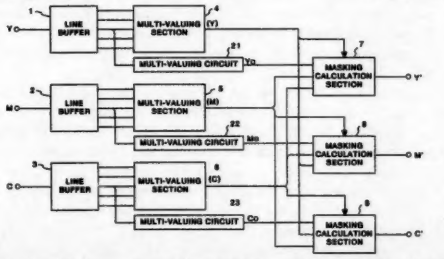
Yoshinobu Mita, Kawasaki, Japan, assignor to Canon Kasbushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 844,941, Mar. 4, 1992, abandoned, which is a continuation of Ser. No. 575,681, Aug. 31, 1990, abandoned. This application Feb. 22, 1994, Ser. No. 200,560

Claims priority, application Japan, Sep. 5, 1989, 1-229784; Jan. 11, 1989, 1-264531

Int. Cl.[6] G06K *9/00*

U.S. Cl. 382—167 **37 Claims**



1. A color image processing apparatus which converts n-level image pixels of a first geometric area of an image into m-level image pixels (n<m), comprising:

first multi-valuing means for generating an m-level main-color-component signal based on an n-level signal representing a main color component of pixels in the first geometric area of the image;

second multi-valuing means for forming a signal representative of a pixel density for at least one sub-color component, in a second geometric area of the image having a greater number of pixels than the first geometric area of the image;

color masking means for mask correcting the main-color-component signal generated by said first multi-valuing means for the first geometric area of the image based on the pixel density representative signal formed by said second multi-valuing means; and

image forming means for forming an image based on the mask corrected image on a medium.

5,488,673

IMAGE PROCESSING WITH FIXED OR VARIABLE THRESHOLD

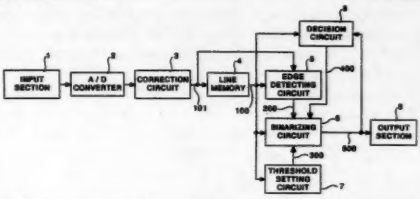
Akihiro Katayama, Kawasaki, and Hidefumi Oosawa, Kawaguchi, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 116,546, Sep. 7, 1993, abandoned, which is a continuation of Ser. No. 787,628, Nov. 4, 1991, abandoned, which is a division of Ser. No. 396,339, Aug. 21, 1989, Pat. No. 5,086,484. This application Jul. 19, 1994, Ser. No. 276,643

Claims priority, application Japan, Aug. 24, 1988, 63-208274; Aug. 29, 1988, 63-212386; Aug. 29, 1988, 63-212387; Nov. 8, 1988, 63-208484

Int. Cl.[6] G06K *9/38*

U.S. Cl. 382—270 **5 Claims**



1. An image processing apparatus in which an error occurring when input pixel data is binarized is distributed to a plurality of non-binarized neighboring pixels, comprising:

input means for inputting pixel by pixel image data representing an original image;

a binarizer for binarizing corrected objective pixel data which is obtained by adding data of an objective pixel input by said input means and data distributed to a position corresponding to the input objective pixel to produce pixel by pixel an output image;

first calculating means for calculating, from an error occurring as a result of binarization by said binarizer, values to be distributed to respective plural non-binarized neighboring pixels which are located in the vicinity of the objective pixel, based upon predetermined weighting factors corresponding to the positions of the non-binarized neighboring pixels;

first distributing means for distributing the values calculated by said first calculating means respectively to the positions of the non-binarized neighboring pixels;

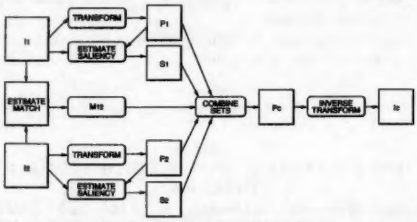
second calculating means for calculating an over flow amount by subtracting the total sum of the values calculated by said first calculating means from the value of the error occurring as a result of binarization by said binarizer; and

second distributing means for distributing the over flow amount calculated by said second calculating means to the position of one neighboring pixel which is located in a different position with respect to the objective pixel position, at least each time the position of the objective pixel is updated.

5,488,674
METHOD FOR FUSING IMAGES AND APPARATUS THEREFOR

Peter J. Burt, Mercer County; Gooitzen S. van der Wal, Mercer; Raymond J. Kolczynski, Mercer, and Rajesh Hingorani, Mercer, all of N.J., assignors to David Sarnoff Research Center, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 884,098, May 15, 1992, Pat. No. 5,325,449. This application May 12, 1993, Ser. No. 59,610
Int. Cl.[6] H04N 9/76
U.S. Cl. 382—284 7 Claims



1. In apparatus for forming a composite image from at least first and second monochrome source images comprising first means for decomposing each of the source images into a set of a plurality of component patterns and deriving a monochrome composite image in response to a weighted average of amplitudes of the component patterns of the source images; the combination therewith of:

second means for assigning amplitudes of a first of opponent colors to first component patterns of a source image in accordance with their normalized weight contribution to said weighted average of the amplitudes of the component patterns of the source images; and

third means for assigning amplitudes of a second of said opponent colors to second component patterns of a source image in accordance with their normalized weight contributions to said weighted average of the amplitudes of the component patterns of the source images; and

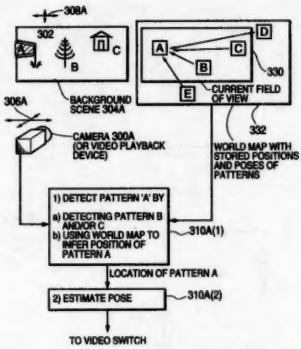
fourth means responsive to outputs from said first, second and third means for augmenting said monochrome composite image with said first and second opponent colors thereby to provide a color composite image.

5,488,675
STABILIZING ESTIMATE OF LOCATION OF TARGET REGION INFERRED FROM TRACKED MULTIPLE LANDMARK REGIONS OF A VIDEO IMAGE

Keith J. Hanna, Princeton, N.J., assignor to David Sarnoff Research Center, Inc., Princeton, N.J.

Filed Mar. 31, 1994, Ser. No. 222,207
Int. Cl.[6] H04N 9/74
U.S. Cl. 382—284 5 Claims

1. In an image processing method for inserting a given pattern at a target region having a particular location with respect to a scene being viewed by an image sensor which produces a series of successive image frames, wherein said scene includes at least two landmark regions displaced in position from one another; and wherein said method comprises the computation steps of (a) inferring the size and position of said particular location within each image frame of said scene from the size and position of a first one of said landmark regions represented within each image frame of said scene and (b) independently inferring the size and position of said particular location within each image frame of said scene from the size and position of a second one of said landmark regions represented within each image frame of said scene, whereby there may be a difference in the size and position of said particular location within each image frame of said scene inferred from the size and position of said second one of said landmark regions with respect to the size and position of said particular location within



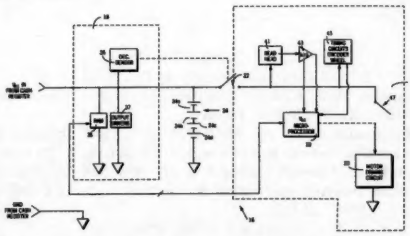
each image frame of said scene inferred from the size and position of said first one of said landmark regions; the improvement comprising the step of:

c) modifying the size and position of the particular location within one of said image frames of said scene inferred from the size and position of said second one of said landmark regions within that one of said image frames so that it is substantially the same as the size and position of the particular location within that one of said image frames of said scene inferred from the size and position of said first one of said landmark regions.

5,488,676
MINIATURE MICR DOCUMENT READER WITH POWER MANAGEMENT AND MOTORIZED CONVEYANCE

Richard W. Harding, Jr., Atlanta, Ga., assignor to Checkmate Electronics, Inc., Roswell, Ga.

Continuation of Ser. No. 819,498, Jan. 10, 1992, abandoned. This application Aug. 30, 1994, Ser. No. 298,179
Int. Cl.[6] G06K 9/20
U.S. Cl. 382—320 19 Claims



1. A document reader having dormant and active modes for cooperation with an electronic cash register (ECR) host and an electronic data entry keyboard which receives a supply of DC electrical power from said ECR host, said document reader including:

first circuitry which includes a connector connectable to said data entry keyboard so as intercept at least a part of said supply of DC electrical power supplied by said ECR to said keyboard during both said dormant and active modes;

second circuitry which is active only during said active mode of said document reader and which demands a peak supply of DC electrical power in excess of that supplied by the ECR host to the keyboard;

a power storage component connected to said first circuitry for receiving said intercepted DC electrical power from said ECR host and for storing said intercepted DC electrical power during said dormant mode; and

a power management switch coupled to said power storage component and said second circuitry for enabling said stored DC electrical power to be transferred to and used by said second circuitry during said active mode to satisfy said peak electrical power demand thereof.

5,488,677

ELECTRIC FIELD SENSOR

Yuichi Tokano, Sendai, Japan, assignor to Tokin Corporation, Miyagi, Japan

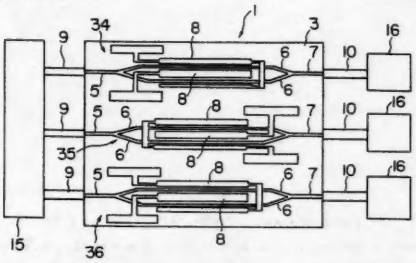
PCT No. PCT/JP94/01110, § 371 Date Mar. 7, 1995, § 102(e) Date Mar. 7, 1995, PCT Pub. No. WO95/02193, PCT Pub. Date Jan. 19, 1995

PCT Filed Jul. 7, 1994, Ser. No. 397,076

Claims priority, application Japan, Jul. 7, 1993, 5-167857; Jul. 7, 1993, 5-167861; Feb. 25, 1994, 6-053256

Int. Cl.[6] G02F *1/035*

U.S. Cl. 385—3 **4 Claims**



1. An electric field sensor comprising a sensor head having a substrate and an optical modulator attached to said substrate, a package accommodating said sensor head, and an antenna attached to the outside of said package and connected to said optical modulator, said optical modulator comprising an incident optical waveguide formed on said substrate, two phase-shift optical waveguides which are formed on said substrate to be branched from said incident optical waveguide and each of which has a variable refractive index varying in response to an electric field intensity applied thereto, an outgoing optical waveguide formed on said substrate to join said phase-shift optical waveguides, and two modulation electrodes formed on or in the vicinity of said phase-shift optical waveguides, said antenna having two rod antenna elements respectively connected to said modulation electrodes, said rod antenna elements extending in opposite directions with their one ends located at a center portion of said package and being arranged in parallel to said phase-shift optical waveguides.

5,488,678

ASSEMBLY STRUCTURE FOR AN OPTICAL INTEGRATED CIRCUIT DEVICE

Mototaka Taneya; Hidenori Kawanishi, both of Nara; Tatsuya Morioka, Tenri, and Atsushi Shimonaka, Nara, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 1, 1994, Ser. No. 283,743

Claims priority, application Japan, Aug. 3, 1993, 5-192608

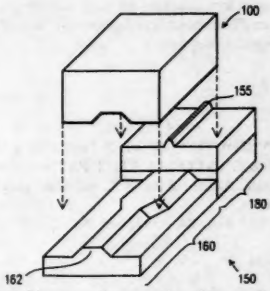
Int. Cl.[6] G02B *6/12*

U.S. Cl. 385—14 **5 Claims**

1. An assembly structure for an optical integrated circuit device, comprising:

an optical integrated circuit substrate in which a layered structure including a waveguide is formed on a base, the optical integrated circuit substrate having a first surface profile on an opposite surface of the base, the first surface profile including a first structure which is one of a raised structure and a recessed structure; and

a semiconductor laser device to be secured on the optical integrated circuit substrate, the semiconductor laser device having



a plurality of layers and a second surface profile on a surface of the layers, the second surface profile corresponding to the first surface profile and including a second structure which has a shape corresponding to the first structure on the optical integrated circuit substrate,

wherein the first structure extends parallel to a waveguide axis of the optical integrated circuit substrate, a cross-sectional shape of the first structure taken parallel to the base is symmetrical with respect to the waveguide axis, and the first structure includes a first tapered profile,

the second structure extends parallel to a light-emitting stripe axis of the semiconductor laser device, a cross-sectional shape of the second structure taken parallel to the layers is symmetrical with respect to the light-emitting stripe axis, and the second structure includes a second tapered profile which corresponds to the first tapered profile of the first structure, and

the first and second surface profiles are fitted to and bonded with each other so as to secure the semiconductor laser device to the optical integrated circuit substrate.

5,488,679

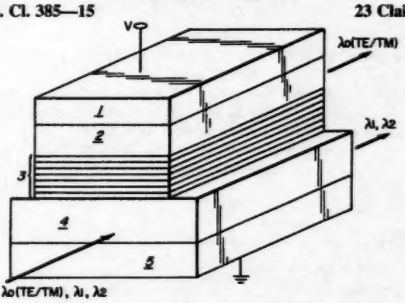
POLARIZATION INDEPENDENT WAVELENGTH TUNABLE FILTER BASED ON BIREFRINGENCE COMPENSATION

Chi Wu, Crescent, Canada, assignor to Northern Telecom Limited, Quebec, Canada

Filed Oct. 27, 1994, Ser. No. 329,923

Int. Cl.[6] G02B *6/26;6/00*

U.S. Cl. 385—15 **23 Claims**



1. A polarization independent wavelength tunable filter compromising:

a first waveguide for receiving an optical signal on at least one wavelength carrier, said wavelength carrier including TM and TE polarization modes;

a second waveguide, spaced from said first waveguide for receiving from said first waveguide said at least one wavelength carrier including both TM and TE polarization modes; and

a coupling region between and integral with said first and second waveguides wherein the physical characteristics of said waveguides and said coupling region are selected so as to

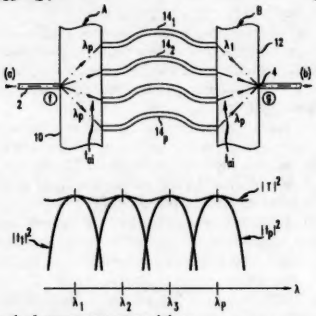
facilitate effective coupling of said wavelength carrier and both TM and TE polarization modes from said first waveguide to said second waveguide.

5,488,680

FREQUENCY ROUTING DEVICE HAVING A WIDE AND SUBSTANTIALLY FLAT PASSBAND

Corrado Dragone, Little Silver, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Aug. 24, 1994, Ser. No. 295,445
Int. Cl.[6] G02B 6/28
U.S. Cl. 385—24 **15 Claims**



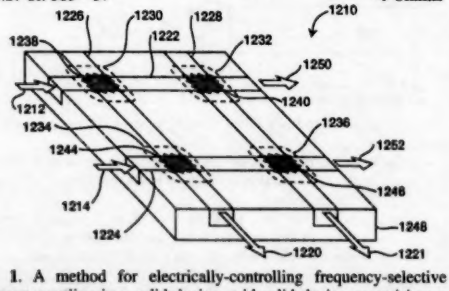
1. An optical apparatus comprising:
a first frequency routing device having at least one input port and P output ports, where P>2;
a second frequency routing device having at least P input ports and at least one output port;
P optical paths coupling the output port of the first frequency routing device to the input port of the second frequency routing device; and
wherein the optical paths each have a transmission coefficient substantially equal to unity at a distinct optical wavelength, each of said transmission coefficients being substantially equal to one half unity at an intermediate wavelength approximately halfway between adjacent ones of said distinct optical wavelengths.

5,488,681

METHOD FOR CONTROLLABLE OPTICAL POWER SPLITTING

David A. G. Deacon, Los Altos; Michael J. Brinkman, Redwood City, and William K. Bischel, Menlo Park, all of Calif., assignors to Deacon Research, Palo Alto, Calif.

Filed Sep. 9, 1994, Ser. No. 303,992
Int. Cl.[6] G02B 6/36
U.S. Cl. 385—37 **4 Claims**



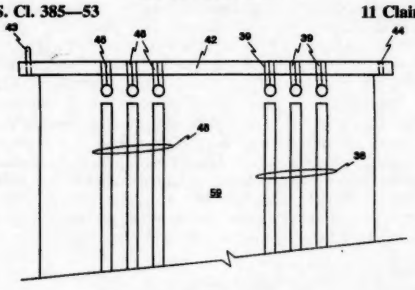
1. A method for electrically-controlling frequency-selective beam coupling in a solid device, said solid device comprising: a solid material having a pattern of differing domains, at least a first type of said domains being a poled structure and forming at least two elements alternating with a second type of said domains and defining a grating; at least a first electrically-conductive material forming a first electrode, said first electrode confronting said solid material and bridging at least two of said elements of said first type of poled structure; a waveguide segment traversing said solid material; a waveguide wye junction having a first arm and a second arm, said wye junction being coupled to said waveguide segment, said method comprising:
superimposing a first optical mode and a second optical mode in said waveguide segment; and
applying an electric field through said grating to selectively control coupling of optical energy in said waveguide segment with said first arm and said second arm to control power in the first optical mode and the second optical mode such that superposition of said first optical mode and said second optical mode result in selective spatial concentration of power in said waveguide segment.

5,488,682

POLYMER BASED OPTICAL CONNECTOR

Gerald F. Sauter, Eagan, and Rick C. Stevens, Apple Valley, both of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Jul. 5, 1994, Ser. No. 270,984
Int. Cl.[6] G02B 6/32
U.S. Cl. 385—53 **11 Claims**

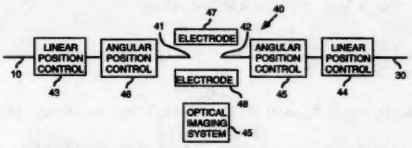


1. An optical connector of the type useful for interconnecting operational modules onto an optical backplane, comprising:
a backplane for supporting said optical connector,
a low index of refraction layer on said backplane,
a plurality of polymer waveguides formed on top of said low index of refraction layer,
said waveguides having exposed light transmitting/receiving ends,
a precision recess formed in said backplane juxtaposed each of said transmitting/receiving ends of said waveguides,
collimating lens means mounted in each said precision recess opposite the ends of said polymer waveguides,
light shielding means on top of said polymer waveguides,
window means mounted on said backplane opposite said lens means, and
said window means having positioning means thereon for indexing said optical connector relative to a mating optical connector.

5,488,683
METHOD FOR SPLICING POLARIZATION MAINTAINING FIBER WITH ELLIPTICAL STRESS MEMBER

Ronald J. Michal, Wrightwood, and Fernando Torres, Canoga Park, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Apr. 29, 1994, Ser. No. 235,172
Int. Cl.[6] G02B *6/255*
U.S. Cl. 385—98 **4 Claims**



1. A method for forming an end-to-end splice in a pair of polarization-maintaining optical fibers that each have a core and a cladding with an elliptical stress member being in the cladding to produce stress induced birefringence in the polarization-maintaining optical fibers, comprising the steps of:

(a) placing the ends of the pair of polarization-maintaining optical fibers end-to-end with a predetermined gap between the ends of the fibers;

(b) examining the sides of the pair of optical fibers with an optical imaging apparatus;

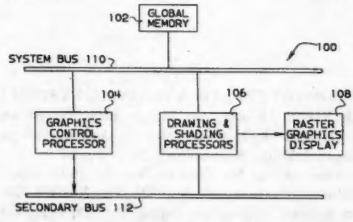
(c) defocusing the optical imaging apparatus on the pair of optical fibers such that scattered light from the interfaces of the core and cladding becomes visible to form an alignment band in each of the pair of polarization-maintaining optical fibers; and

(d) adjusting the angular position of one of the polarization maintaining optical fibers relative to the other one of the polarization-maintaining optical fibers until the alignment bands in the polarization-maintaining optical fibers are in longitudinal alignment.

5,488,684
METHOD AND APPARATUS FOR RENDERING TRIMMED PARAMETRIC SURFACES

Nader Gharachorloo, Ossining, and William L. Luken, Ulster Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 86,750, Jul. 1, 1993, abandoned, which is a continuation of Ser. No. 620,965, Nov. 30, 1990, abandoned. This application Sep. 23, 1994, Ser. No. 311,701
Int. Cl.[6] G06T *15/30*
U.S. Cl. 395—123 **19 Claims**



11. In a computer graphics system having a polygon processor capable of processing concave polygons, apparatus for rendering a trimmed parametric surface representing a mapping from U and V parametric coordinates to X and Y geometric coordinates, said X and Y geometric coordinates for deriving the location of graphics entities on a computer graphics display, said parametric surface having multiple patches and a trimming region bound by a trim polyline, said apparatus comprising:

(a) means for dividing the parametric surface having multiple patches into a plurality of contiguous U and V intervals intersecting to form a grid of UV rectangles, said trim polyline intersecting a subset of said UV rectangles to divide each of the UV rectangles of the subset into at least one polygon lying within the trimming region and at least one polygon lying outside of the trimming region; and

(b) means for processing each V interval intersected by the trim polyline comprising:

(1) means for determining vertices of a V polygon lying within the trimming region formed by the intersection of the trim polyline and the V interval;

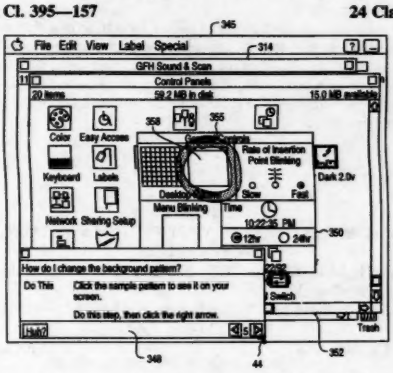
(2) means for determining vertices of U polygons formed by the intersection of the V polygon and said U intervals; and

(c) means for providing vertex data for said vertices to the polygon processor to render the polygon for said computer graphics display.

5,488,685
METHOD AND APPARATUS FOR PROVIDING VISUAL CUES IN A GRAPHIC USER INTERFACE

James E. Palmer, Redwood City; John R. Powers, III, Monte Sereno; Patricia J. Coleman, Menlo Park; Gregory S. Brewer, Pleasanton; Jeffrey A. Herman, Palo Alto, and Eli Cochran, Menlo Park, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Jan. 27, 1993, Ser. No. 10,062
Int. Cl.[6] G06F *3/14*
U.S. Cl. 395—157 **24 Claims**



1. In a data processing display system having a display, a method for providing visual cues to a user comprising the steps of:

(a) displaying on said display a user interface having a plurality of objects;

(b) displaying on said display, in response to said user providing a first signal by inputting a help inquiry, a coach mark having at least one geometric shape to visually identify at least one of said objects on said user interface to said user,

wherein said coach mark is displayed on said user interface such that said coach mark is rendered over time to achieve the visual appearance of being animated and drawn free-hand on said user interface by a human being;

(c) displaying on said display an access window having a first working area and at least one access button function;

(d) selecting one of said at least one access button function;

(e) displaying a plurality of phrases in said first working area;

(f) selecting one of said displayed phrases; and

(g) displaying on said display a presentation window including instruction data related to said selected phrase.

5,488,686

DATA PROCESSING SYSTEM

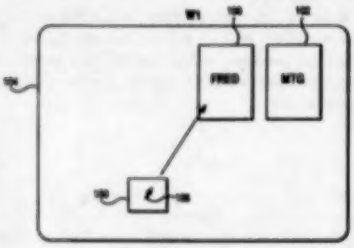
Alan S. Murphy, Hiltingbury, and Patricia Tustin, Locks Heath, both of, United Kingdom, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 13, 1992, Ser. No. 867,932

Claims priority, application United Kingdom, Jul. 13, 1991, 9115142

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—161 **11 Claims**



1. A data processing system with a plurality of workspaces for performing one or more tasks in response to user inputs, comprising:

(a) means for enabling communication between the plurality of workspaces;

(b) a screen object associated with each of said plurality of workspaces;

(c) a data structure for storing a list of user profile information for each user; and

(d) means for selecting a screen object by a user in a first of the plurality of workspaces, the screen object corresponding to a second of the plurality of workspaces, and initiating visual, audio or data communication between the user and the second workspace according to the user profile information stored in the data structure.

5,488,687

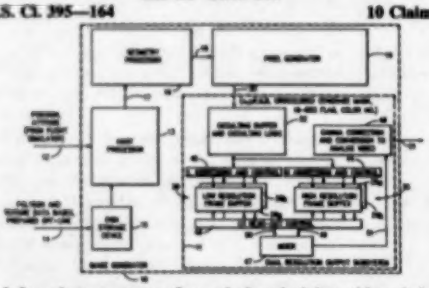
DUAL RESOLUTION OUTPUT SYSTEM FOR IMAGE GENERATORS

Henry H. Rich, Raleigh, N.C., assignor to Star Technologies, Inc., Sterling, Va.

Filed Sep. 17, 1992, Ser. No. 946,082

Int. Cl.[5] G06T *1/60*

U.S. Cl. 395—164 **10 Claims**



1. In an image generator for producing pixel data with occluded and unoccluded portions having pixel color components and to produce target pixels with a high resolution flag and a color number, a real time output system of said image generator comprising:

occulting logic means for receiving pixel data with unoccluded portions and with color components and with high resolution flag means and with color identifying numbers for generating output occluded pixels and pixel fragments;

high resolution frame buffer means and low resolution frame buffer means connected to receive said output pixels and pixel fragments of said occulting logic means and

mixer circuit means for performing color table, weighting and delay logic functions, and connected to receive output data of said high and low resolution frame buffer means for combining said output data for developing data for display;

wherein output pixels and pixel fragments from the occulting logic means are selectively provided to either the high resolution frame buffer means or the low resolution frame buffer means in response to said flag means.

5,488,688

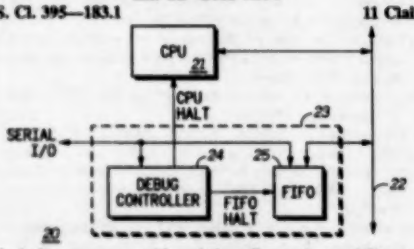
DATA PROCESSOR WITH REAL-TIME DIAGNOSTIC CAPABILITY

David R. Gonzales, and Gordon A. Carichner, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 30, 1994, Ser. No. 220,329

Int. Cl.[6] G06F *11/34*

U.S. Cl. 395—183.1 **11 Claims**



1. A data processor with real-time diagnostic capability, comprising:

a central processing unit (CPU) coupled to a bus, for continuously executing instructions during a normal operation mode, and for suspending instruction execution in response to a CPU halt signal;

a first-in, first-out memory (FIFO) coupled to a portion of said bus, for sequentially storing states of said portion of said bus at corresponding locations of a plurality of locations when a FIFO halt signal is inactive; and

a debug controller coupled to said CPU and to said FIFO, for activating both said CPU halt signal and said FIFO halt signal in response to an event condition in a first mode, and for activating said FIFO halt signal but keeping said CPU halt signal inactive in response to said event condition in a second mode,

wherein said plurality of locations of said FIFO are observable while said CPU is in said normal operation mode.

5,488,689

ROBOT OPERATION TRAINING SYSTEM

Kunitada Yamato, Kakogawa; Masato Fuji, Akashi, and Naohiro Fukuda, Kakogawa, all of, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 996,610, Dec. 24, 1992, abandoned. This application Sep. 26, 1994, Ser. No. 313,726

Claims priority, application Japan, Sep. 18, 1992, 4-250106

Int. Cl.[6] B25J *13/00;9/22*

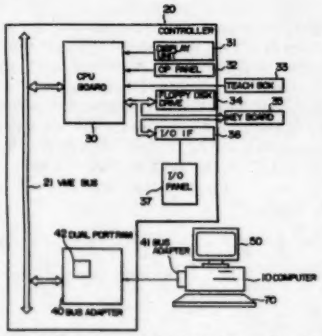
U.S. Cl. 395—99 **9 Claims**

1. A robot operation training system, comprising:

teaching data inputting means for inputting teaching data;

control means for receiving the teaching data and generating and sequentially outputting encoder command data to control an operation of a real robotic arm in response to the teaching data inputted through said teaching data inputting means;

display means for displaying visual model of simulated robot motion in animation responsive to the teaching data; and



picture describing means for calculating and outputting said visual model to be displayed on the display means, on the basis of the encoder command data sequentially outputted from said control means without connecting the real robotic arm, wherein said picture describing means, said teaching data inputting means and said control means comprise a real controller for the real robotic arm, and said picture describing means comprises personal computer.

5,488,690

COLOR VIDEO PRINTER WHICH ENABLES A PATTERN GENERATION PROCESS WHEN NO SYNCHRONIZING SIGNALS ARE DETECTED

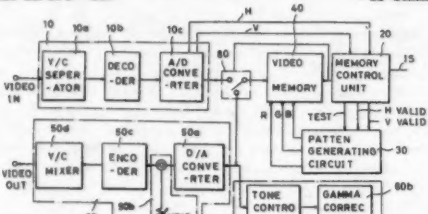
Won S. Cho, Kyungki, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 18, 1992, Ser. No. 992,765

Claims priority, application Rep. of Korea, Dec. 20, 1991, 23549/1991

Int. Cl.[6] G03G *15/01*

U.S. Cl. 395—109 **11 Claims**



1. A color video printer comprising:

first signal processing means for processing a video signal inputted therein to be storable and detecting synchronizing signals from the inputted video signal;

memory control means for outputting read and write signals as memory control signals and generating a predetermined color test control signal upon receiving no synchronizing signals from said first signal processing means;

pattern generating means being enabled by the color test control signal from said memory control means for outputting a video pattern signal;

video memory means for storing the video signal from said first signal processing means or the video pattern signal from said pattern generating means in response to the write signal from said memory control means and outputting the stored video signal or video pattern signal in response to the read signal from said memory control means;

second signal processing means for processing the video signal or the video pattern signal read from said video memory means to be displayable;

third signal processing means for processing the video signal or the video pattern signal read from said video memory means to be printable; and

printing means for printing a desired video based on an output signal from said third signal processing means.

5,488,691

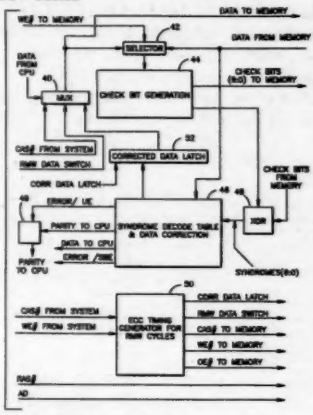
MEMORY CARD, COMPUTER SYSTEM AND METHOD OF OPERATION FOR DIFFERENTIATING THE USE OF READ-MODIFY-WRITE CYCLES IN OPERATING AND INITIALIZAITON MODES

Daniel P. Fuoco, Boca Raton, Fla.; Christopher M. Herring; Mark W. Kellogg, both of Essex Junction, Vt., and Jorge E. Lenta, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 17, 1993, Ser. No. 154,193

Int. Cl.[6] G06F *11/10*

U.S. Cl. 395—185.05 **5 Claims**



1. A computer system comprising:

a CPU;

at least one memory card interfaced with said CPU;

said said CPU and said card being:

configured to write and store multiple byte data words at a given address,

configured to write all of the bytes of said data word or write less than all the bytes of said word selectively to memory,

free of error correction code capabilities but capable of providing varying wait states for memory write operations,

configured to provide sufficient cycle time for logic elements provided on said card to perform a read-modify-write operation to memory;

said CPU and said card functioning together in an operating mode and an initialization mode in which read-modify-write cycles are used;

said card comprising:

check bit logic to generate check bits and write logic to write said data words and said associated check bits to said selected memory location;

detector logic to detect when less than all of the data bytes are to be rewritten to a selected address and to initiate a read-modify-write cycle;

read-modify-write logic to perform a read-modify-write cycle wherein (a) data bytes at the given address that are not to be rewritten are read from memory and multiplexed with bytes that are to be rewritten, (b) check bits are generated from multiplexed bytes and the multiplexed data bytes and (c) check bits are written to memory;

said read-modify-write logic including delay logic to generate a delay in the write cycle for a sufficient time to read said data bytes from memory, multiplex said read data bytes with the newly written data bytes and write the multiplexed data bytes and check bits to memory;

read logic to read the data bytes and check bits from memory;

error correction code logic to generate syndrome bits and correct all one bit errors when said CPU are in the operating mode; and

blocking logic to block reporting or correcting of any errors detected when said CPU and said card are in the initialization mode.

5,488,692

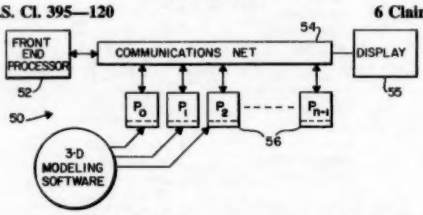
SYSTEM AND METHOD FOR REPRESENTING AND MANIPULATING THREE-DIMENSIONAL OBJECTS ON MASSIVELY PARALLEL ARCHITECTURES

Michael S. Karasick, Ridgefield, Conn., and David R. Strip, Albuquerque, N.M., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 641,471, Jan. 15, 1991, abandoned. This application Aug. 11, 1994, Ser. No. 289,181

Int. Cl.[6] G06F *3/14*

U.S. Cl. 395—120 **6 Claims**



1. A method for modelling a three-dimensional object that includes vertices, faces and edges, said method implemented on a parallel computing system which includes a front and processor for issuing modelling instructions and plural modelling processors responsive to said modelling instructions, each modelling processor having an assigned unique label, said method comprising the steps of:

storing directed-edge (d-edge) data structures in a plurality of said modelling processors, each d-edge having a label equal to the unique label of the modelling processor in which it is stored, a plurality of d-edges defining a face of said three-dimensional object, said plurality of d-edges sequentially valued, said face having a label equal to one of a sequentially valued d-edge, said data structure defining a d-edge with at least vertex descriptions of an associated edge of said face and a description of said face;

issuing an instruction to said modelling processors to model at least a face of said three-dimensional object, said instruction including a designation of said face;

enabling each said modelling processor to determine if a d-edge data structure having a label equal to the label of said face that is to be modeled, is stored therein; and

operating each said modelling processor which includes a d-edge data description equal to the label of said face, to execute, simultaneously with all other modelling processors including a d-edge data description equal to the label of said face, a modelling instruction with respect to each said stored d-edge data description stored therein.

5,488,693

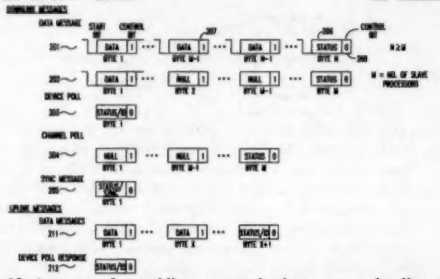
PROTOCOL WITH CONTROL BITS AND BYTES FOR CONTROLLING THE ORDER OF COMMUNICATIONS BETWEEN A MASTER PROCESSOR AND PLURAL SLAVE PROCESSORS

Warren B. Houck, Fair Haven; Vincent A. Illuzzi, Toms River; Mary E. Ricker, Hazlet, and Richard S. Vidil, Eatontown, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Jun. 24, 1992, Ser. No. 903,304

Int. Cl.[6] H04B *3/00*

U.S. Cl. 395—200.05 **20 Claims**



12. Apparatus for enabling communications over a plurality of communication paths connected thereto, said apparatus comprising

means for receiving a downlink message over a first communication path, said downlink message including a plurality of information bytes, each byte except a last byte comprising a data portion followed by a control bit at a first state and said last byte comprising a status portion followed by a control bit at a second state;

means for monitoring a state of a third communication path during the reception of said downlink message;

means, responsive to a first state of said third path and an indication that said apparatus desires to send an uplink message, for establishing a second state on said third path during a predetermined unique byte of said received downlink message, the unique byte being associated with said apparatus; and

means for sending an uplink message over a second communication path after the complete reception of said downlink message as determined by said control bit at said second state in said last byte of said downlink message, said uplink message including at least one information byte, wherein each byte except a last byte comprises a data portion followed by a control bit at a first state bit and said last byte comprises a status portion followed by a control bit at a second state.

5,488,694

BROADCASTING HEADERS TO CONFIGURE PHYSICAL DEVICES INTERFACING A DATA BUS WITH A LOGICAL ASSIGNMENT AND TO EFFECT BLOCK DATA TRANSFERS BETWEEN THE CONFIGURED LOGICAL DEVICES

Mark P. McKee, Alameda; John Zapisek, Santa Clara; David M. Bulfer, Santa Clara; John M. Long, Santa Clara; John R. Nickolls, Santa Clara, and William T. Blank, Santa Clara, all of Calif., assignors to MasPar Computer Company, Sunnyvale, Calif.

Filed Aug. 28, 1992, Ser. No. 937,639

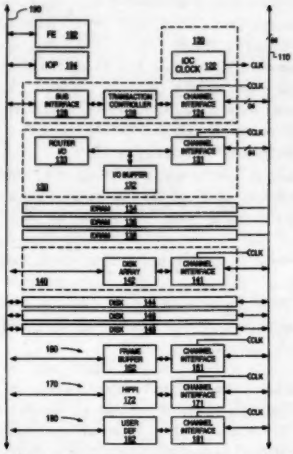
Int. Cl.[6] G06F *13/00;13/138*

U.S. Cl. 395—824 **21 Claims**

1. In a data processing system input/output ("I/O") channel, a method for effecting a block data transfer between physical devices coupled through respective interfaces to a data I/O bus, comprising the steps of:

assigning a unique physical address to each of the interfaces;

individually configuring a particular one of the interfaces by:



broadcasting to the interface a first header to select the particular interface in accordance with the physical address thereof for receipt of configuration data; and

subsequent to said first header broadcasting step, broadcasting configuration data, including a logical device assignment, to the interfaces;

wherein the particular interface acquires a configuration, including a logical device assignment, in accordance with the configuration data, and the interfaces other than the particular interface are not configured by the configuration data;

repeating said individual interface configuration step so that each of the interfaces are configured;

initiating an I/O transaction on the bus by placing a second header on the data I/O bus to select one or more of the physical devices as a source logical device in accordance with the logical device assignments of their respective configured interfaces, and one or more of the physical devices as a destination logical device in accordance with the logical device assignments of their respective configured interfaces, at least one of the source logical device and the destination logical device comprising a subset of at least two of the physical devices, and the second header identifying for each of the physical devices in the subset a schedule of mutually exclusive and repeated participation in the block data transfer; and

activating the source logical device and the destination logical device as established in the initiating step to autonomously achieve the block data transfer based upon the schedules.

5,488,695

VIDEO PERIPHERAL BOARD IN EXPANSION SLOT INDEPENDENTLY EXERCISING AS BUS MASTER CONTROL OVER SYSTEM BUS IN ORDER TO RELIEF CONTROL OF HOST COMPUTER

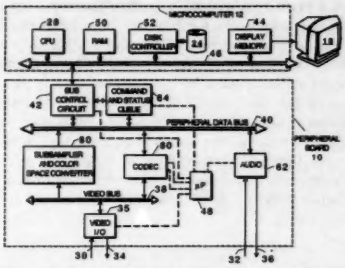
Daniel F. Cutter, Boxboro, Mass., assignor to Data Translation, Inc., Marlboro, Mass.

Continuation of Ser. No. 48,490, Apr. 16, 1993, abandoned. This application Mar. 16, 1995, Ser. No. 405,763

Int. Cl.[6] G06F *13/12;13/14*

U.S. Cl. 395—290 **25 Claims**

1. A video peripheral board having connections for an expansion slot of a general purpose computer for providing video I/O capabilities to said general purpose host computer, said general purpose computer having a system bus, data storage accessed by read and write operations over said system bus, and a central processing unit, said system bus being controllable by said central processing



unit (CPU) or by an external device connected to said system bus, the video peripheral board comprising:

a video I/O port connected to a video device;

a bus interface circuit connected to said system bus of the host computer and to said video I/O port, said bus interface circuit including a bus master address generator that generates addresses of said storage for read and write operations over said system bus, a data buffer storing video data for transfer to or from said system bus, and bus control logic that provides and receives bus control signals to and from said system bus to effect read and write operations over said system bus independent of said central processing unit of said general purpose host computer, said bus interface circuit thereby being bus master of said system bus; and

a processor connected to control said video I/O port and said bus control logic of said bus interface circuit to effect transfer of video data between said video I/O port and said data buffer land transfer between said data buffer and said storage of the host computer at addresses generated by said bus master address generator, said video data passing through said video I/O port in real time wherein:

the video peripheral board has two or more data paths through the video peripheral board to said bus interface circuit, each said data path having two ends and a priority, at least one said data path being connected between said bus interface circuit and said video I/O port; and

said processor is configured to control said bus interface circuit and said data paths to effect real time transfers of data over said data paths, and to schedule completion of a transfer over a higher-priority one of said data paths in preference to a transfer over a lower-priority one of said data paths.

5,488,696

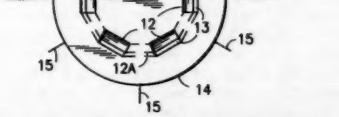
LIGHT - REFLECTING WAVEGUIDE ASSEMBLIES AND PROCESS

Kerry R. Brosnan, 3255 Madison Ave., Apt. #3, Bridgeport, Conn. 06606

Filed Mar. 28, 1995, Ser. No. 411,473

Int. Cl.[6] G02B *6/10*

U.S. Cl. 385—129 **11 Claims**



1. A light-reflecting waveguide illumination assembly comprising a thin waveguide sheet or panel having an upper surface and a lower surface enclosing a core! and being capable of transmitting light introduced through one or more edges of said core by internal

reflection, a plurality of reflective mirror surfaces within said core and extending diagonally therethrough at predetermined angles from the upper surface toward the lower surface, a plurality of optical fibers, one end of which is coupled with one or more edges of said sheet or panel, and a remote light-emission source which is coupled with the other end of said optical fibers to supply light-waves through said fibers and through the core of said waveguide sheet or panel, each of said mirror surfaces being located within said core to reflect said lightwaves out of the plane of said core and through a common surface and in a common direction to illuminate an area adjacent to said sheet or panel.

5,488,697

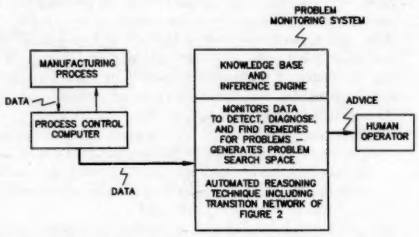
PROBLEM STATE MONITORING SYSTEM

William F. Kaemmerer, Minneapolis, Minn., and James R. Allard, Brookline, Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 898,642, Jun. 15, 1992, abandoned, which is a division of Ser. No. 433,401, Nov. 7, 1989, Pat. No. 5,193,143, which is a continuation-in-part of Ser. No. 363,374, Jun. 2, 1989, abandoned, which is a continuation of Ser. No. 143,898, Jan. 12, 1988, abandoned. This application Mar. 8, 1994, Ser. No. 208,065

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—51 **1 Claim**


PROBLEM MONITORING SYSTEM
MANUFACTURING PROCESS
DATA
PROCESS CONTROL COMPUTER
DATA
KNOWLEDGE BASE AND INFERENCE ENGINE
MONITORS DATA TO DETECT, DIAGNOSE, AND FIND REMEDIES FOR PROBLEMS – GENERATES PROBLEM SEARCH SPACE
AUTOMATED REASONING TECHNIQUE INCLUDING TRANSITION NETWORK OF FIGURE 2
ADVICE
HUMAN OPERATOR

1. An expert system for diagnosing and providing remedies for problems in a controlled system, said controlled system having a plurality of data points from which said problems may be determined and said expert system comprising a set of nodes, each node comprising at least four necessary elements:

a state holder means, having an indication of the state of the node, for communicating the state of the node to other nodes;

an immediate descendant tally means for holding a representation of state information of all direct descendant nodes relative to the node having said tally means, and for providing an indication of whether said direct descendant has been "confirmed" or "rejected" as a cause of said problem;

test means for determining whether said node has a problem by referencing an information holder;

algorithmic mechanism means for performing the activities of said node; and,

at least a select one of the following additional elements:

an advice list means, having a list of advice members, for solving a problem and providing a flag for each member of the advice list indicative of whether a particular advice member has been given advice currently,

a communications link means for transferring advice to an entity that monitors or controls the controlled system, and

an information holder means connected to an information generating device for indicating the state of the information generating device; and wherein the algorithmic mechanism means element of each node comprises means for:

A. Determining whether the problem has been remedied; if so, transitioning to a "Resolved" state,

B. Otherwise, if new direct descendants of the node can be generated, adding them to said tally means and transitioning the node to a "Pending" state,

C. Otherwise, if more than zero of the node's descendants are not either in a "Confirmed" or a "Rejected" state, no transitioning is made,

D. Otherwise, if the node has no descendants in a "Confirmed" state, then if the node has an advice list which contains some remedial advice associated with said node, transitioning the node to a "Ready" state; else transitioning the node to a "No-Remedy" state,

E. Otherwise, if more than zero of the nodes which are in the "Confirmed" state are furthermore in either a "Fixed" or a "Can't-be-Fixed" state, transitioning the node to a "Diagnosed" state,

F. Otherwise, if the node has direct descendants in the "Can't-be-Fixed" state, and the node is not already transitioned to the "No-Remedy" state, transitioning said node to the "No-Remedy" state; if not then transitioning said node to an "Uncle" state, and,

G. Otherwise, if the advice list contains some remedial advice associated with this node, transitioning the node to the "Ready" state unless the node is not already transitioned to the "No-Remedy" state, in which case transitioning the node to the "No-Remedy" state; otherwise, transitioning the node to the "Uncle" state.

5,488,698

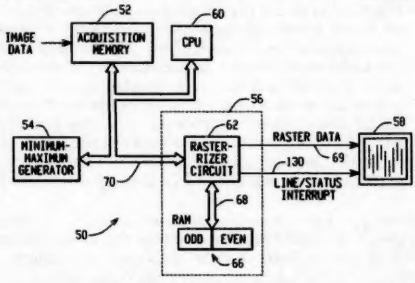
RASTERIZATION OF LINE SEGMENTS USING DIFFERENCE VECTORS

David C. Oliver, 11146 Vance Johnson #2503, San Antonio, Tex. 78230-2560, and Michael J. Petrillo, 1240 Waldo Way, Twinsburg, Ohio 44087

Filed Nov. 5, 1992, Ser. No. 972,113

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—110 **17 Claims**



1. An apparatus for processing image data comprising a plurality of groups of data values, said apparatus comprising:

memory means for storing difference vectors for controlling an output of a display;

means for generating each of said difference vectors as a function of a minimum data value and a maximum data value included within a corresponding group of said data values; and

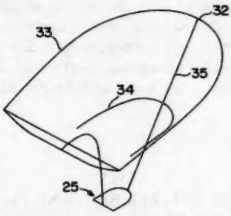
means for outputting said difference vectors from said memory means to produce an image on a display, said display comprising an M-by-N array of display elements, and said difference vectors comprising M difference vectors each comprising N vector elements, said means for generating comprising means for incrementing a value of a vector element corresponding to said minimum data value in said difference vector, and means for decrementing a value of a vector element corresponding to said maximum data value in said difference vector.

5,488,699

METHOD FOR GENERATING A COMPUTERIZED THREE DIMENSIONAL MODEL OF A SHOE HEEL AND A TWO DIMENSIONAL COVER FOR THE SAME

Joseph R. Hanson, Jr., Town and Country, Mo., assignor to Brown Group, Inc., St. Louis, Mo.

Filed May 24, 1993, Ser. No. 65,752
Int. Cl.[6] G06T *17/00*
U.S. Cl. 395—119 4 Claims



1. A method for generating a computerized three dimensional model of a shoe heel having a pinch curve, a right-hand breast curve, a left hand breast curve, a seat surface, a breast surface, a back surface, and a toplift surface, comprising the steps of:

a) digitizing into a computer a heel toplift pattern;

b) digitizing into a computer a heel back profile pattern;

c) digitizing into a computer a heel breast profile pattern;

d) entering into a computer a table of values consisting of a heel size, a wedge angle, a heel back height, a heel seat length, a top length, a top width, a shrink percentage, a heel pinch sealing factor, and a pinch percentage;

e) picking a heel seat pattern from a stored look-up table of seat patterns;

f) displaying in a computer said toplift pattern, heel back profile pattern, heel breast profile pattern, and heel seat pattern in pre-defined top, side, front, and isometric views;

g) generating a pinch curve, said pinch curve being a copy of the toplift pattern, scaled by the pinch scaling factor, and placed on the back profile pattern at a point which is the pinch percentage multiplied by the computer calculated length of the back profile curve;

h) computer generating a right-hand breast curve and a left-hand breast curve connecting the ends of the seat pattern, the pinch curve, and the toplift curve;

i) computer generating a seat surface, a breast surface, a back surface, and a toplift surface, said surfaces being directed by said seat pattern, toplift pattern, right-hand breast curve, left-hand breast curve, and pinch curve; and

j) computer generating toolpath information for machine cutting a model of a shoe heel.

5,488,700

IMAGE RENDERING SYSTEM WITH LOCAL, ADAPTIVE ESTIMATION OF INCIDENT DIFFUSE ENERGY

Andrew Glassner, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 30, 1993, Ser. No. 100,087
Int. Cl.[6] G06T *15/50*
U.S. Cl. 395—126 12 Claims

1. A method for coloring pixels of a pixelated display to present a simulated image of a view of objects illuminated by light from light sources and light reflected off the objects, the method comprising the steps of:

defining a space;

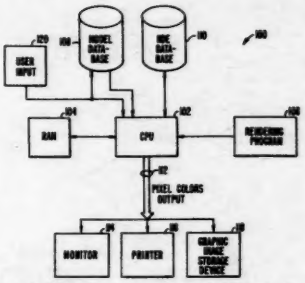
positioning objects and light sources in said space;

positioning a view point in said space;

positioning a view surface in said space;

dividing said view surface into a plurality of unit areas;

associating each unit area of said plurality of unit areas with a pixel of the pixelated display;



initializing a calculation storage area which includes storage for each of a plurality of calculation results, a calculation result including at least an indication of an incident light ray color, an incident light ray direction, and a reflection type selected from a specular reflection type and a diffuse reflection type;

calculating, for each unit area, a color value, said step of calculating a color value comprising the steps of:

tracing at least one ray from said view point through said unit area to intersect a shading point to be shaded on a surface of an object in the space, or to intersect a point on a background surface if no object is intersected by said traced ray;

identifying light rays incident on said shading point, wherein said light rays are identified either by determining which objects and light sources cast light rays onto said shading point, or by determining which objects and light sources provide a specular reflection of light which is incident on said shading point and retrieving a saved indication of diffuse reflections incident on said shading point;

saving an indication of said identified light rays in said calculation storage area, saving at least an indication of an incident light color and direction, and saving an indication of a reflection type for each identified light ray if more than one reflection type is saved, said saving step performed when a new indication is calculated;

calculating a reflected light which would reflect off said intersected surface at said shading point in a direction of an origin of said traced ray when illuminated by said identified light rays, including at least one calculation which is a function of incident light direction at least when the reflection type is a specular reflection type; and

assigning a color of said reflected light in said direction of said traced ray to the pixel associated with said unit area, or a combination of colors of reflected light in the direction of multiple rays if multiple rays are used.

5,488,701

IN LOG SPARING FOR LOG STRUCTURED ARRAYS

James T. Brady, and Jaishankar M. Menon, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

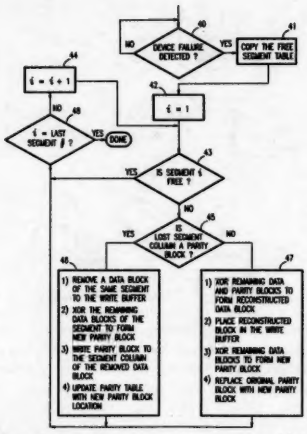
Filed Nov. 17, 1994, Ser. No. 340,977
Int. Cl.[6] G06F *11/34*
U.S. Cl. 395—182.04 31 Claims

1. In a log structured array (LSA) comprising a plurality of storage devices configured in a plurality of segments, wherein a plurality of parity groups are distributed to some of said segments, each parity group comprising a plurality of data block and a parity block, and wherein others of said segments are free, a method for restoring lost ones of said blocks, comprising the steps of:

detecting a failure in one of said plurality of storage devices;

copying a free segment table to a temporary storage to preserve the state of said free segment table at the time of said failure;

testing each segment in said array against said copy of said free segment table, to determine if said segment stores a parity group;


DEVICE FAILURE DETECTED ?
NO
YES
COPY THE FREE SEGMENT TABLE
i = i + 1
i = 1
i = LAST SEGMENT # ?
DONE
IS SEGMENT i FREE ?
IS LOST SEGMENT COLUMN A PARITY BLOCK ?
1) REMOVE A DATA BLOCK OF THE SAME SEGMENT TO THE WRITE BUFFER
2) XOR THE REMAINING DATA BLOCKS OF THE SEGMENT TO FORM NEW PARITY BLOCK
3) WRITE PARITY BLOCK TO THE SEGMENT COLUMN OF THE REMOVED DATA BLOCK
4) UPDATE PARITY TABLE WITH NEW PARITY BLOCK LOCATION
1) XOR REMAINING DATA AND PARITY BLOCKS TO FORM RECONSTRUCTED DATA BLOCK
2) PLACE RECONSTRUCTED BLOCK IN THE WRITE BUFFER
3) XOR REMAINING DATA BLOCKS TO FORM NEW PARITY BLOCK
4) REPLACE ORIGINAL PARITY BLOCK WITH NEW PARITY BLOCK

determining whether a lost segment column in said parity group is a data block or a parity block;

generating a reconstructed data block, if said lost column is determined to be a data block;

generating a new parity block from data blocks in said parity group; and

storing said reconstructed data block and said new parity block in free segments in said array.

5,488,702

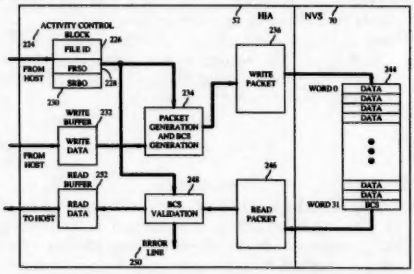
DATA BLOCK CHECK SEQUENCE GENERATION AND VALIDATION IN A FILE CACHE SYSTEM

Larry L. Byers, Appley Valley; Joseba M. Desubijana, Minneapolis, and Wayne A. Michaelson, Circle Pines, all of Minn., assignors to UNISYS Corporation, Blue Bell, Pa.

Filed Apr. 26, 1994, Ser. No. 233,199

Int. Cl.[6] G06F *11/34*

U.S. Cl. 395—186 **20 Claims**



1. A system for detecting errors occurring during storage and retrieval of file information of a file between a processor and a mass storage device, having a unit of data transfer between the processor and the mass storage device of a block of file information of a predetermined number of 32-bit words, each word containing two 16-bit half-words, the storage of file information being requested by a write requester, and the retrieval of file information being requested by a read requester, identification information of the file being specified by a plurality of 16-bit half-words, comprising:

generation means coupled to the mass storage device for generating a key representing a selected block of a file, wherein said key is generated from said selected block of said file, the identification information of said file, and identification information of said selected block supplied by the write requester, and for storing said key and said selected block of said file in the mass storage device: and

validation means coupled to the mass storage device, including retrieval means for retrieving said selected block of said file and said key from the mass storage device, generating means for generating a new key representing said selected block of said file, wherein said new key is generated from said selected block retrieved from the mass storage device, the identification information of said file, and said identification information of said selected block supplied by the read requester, said validation means for comparing said new key to said key retrieved from the mass storage device, and activating an error signal when said new key does not match said key.

5,488,703

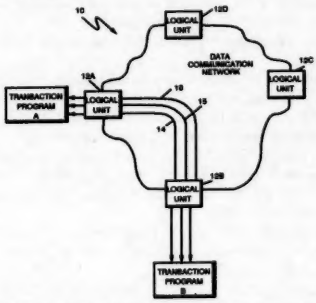
SYSTEM FOR ESTABLISHING AND PERFORMING MULTIPLE CONVERSATIONS SIMULTANEOUSLY BETWEEN TRANSACTION PROGRAMS THROUGH LOGICAL UNITS

Marsha E. Ferree, Raleigh, and James P. Gray, Chapel Hill, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 1, 1992, Ser. No. 876,945

Int. Cl.[6] G06F *15/04*

U.S. Cl. 395—200.12 **10 Claims**



1. A method of establishing a plurality of conversations between a single instance of a first transaction program and a single instance of a second transaction program over a communication network which includes at least first and second logical units (LUs) connected, respectively, to said first and second transaction programs and to each other by a plurality of LU-LU communication sessions over which electronic signal representing both data and control are exchanged under control of said transaction programs, said method comprising steps of:

establishing a communication link between a single instance of a first transaction program and a single instance of a second transaction program; and

initiating a first conversation between said single instance of said first transaction program and said single instance of said second transaction program over a first LU-LU communication session using said first and second LUs so that data and control signals may be exchanged therebetween; and

initiating a second conversation between said single instance of said first transaction program and said single instance of said second transaction program over a second LU-LU communication session using said first and second LUs so that data and control signals may be exchanged between said single instance of said first transaction program and said single instance of said second transaction program, over said first and second LU-LU communication sessions; and

wherein said first and second conversations occur simultaneously over said LU-LU communications sessions.

5,488,704

SPEECH CODEC

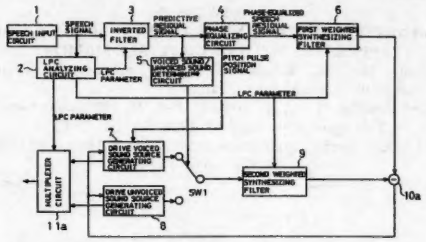
Mitsuo Fujimoto, Nara, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Mar. 15, 1993, Ser. No. 31,808

Claims priority, application Japan, Mar. 16, 1992, 4-058078; Dec. 28, 1992, 4-348880

Int. Cl.[6] G10L *9/14*

U.S. Cl. 395—228 **18 Claims**



1. A speech codec, comprising:

pitch extracting means for extracting a pitch-scale on the basis of a signal of an inputted speech;

voiced sound/unvoiced sound determinating means for determinating whether said inputted speech is one of a voiced sound speech and unvoiced sound speech on the basis of the signal of said inputted speech;

drive sound source generating means for generating a drive sound source signal on the basis of said pitch-scale and a determination result of said voiced sound/unvoiced sound determinating means, said drive sound source generating means including drive voiced sound source generating means for generating drive voiced sound source signal when said inputted speech is the voiced sound speech, and unvoiced sound source generating means for generating a drive unvoiced sound source signal when said inputted speech is the unvoiced sound speech, wherein said drive voiced sound source generating means includes pulse pattern generating means for generating a pulse pattern signal corresponding to said pitch-scale; first adaptive code book means for storing drive voiced sound source signals within a predetermined past time period; first noise code book means for storing in advance a noise signal; and first generating means for generating the drive voiced sound source signal on the basis of said pulse pattern signal, an output of said first adaptive code book means and an output of said first noise code book means;

speech synthesizing means for outputting a synthesized speech signal on the basis of one of said drive voiced sound source signal and said drive unvoiced sound source signal generated by said drive sound source generating means; and

code outputting means for selectively outputting a code corresponding to one of said drive voiced sound source signal and said drive unvoiced sound source signal at a timing that an error between said synthesized speech signal and the signal of said inputted speech becomes minimum by comparing the synthesized speech signal and the signal of said inputted speech.

5,488,705

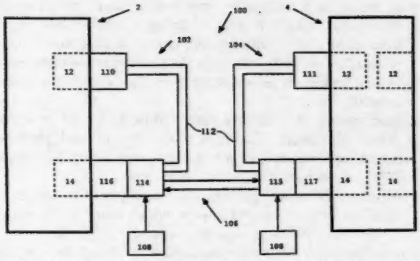
APPARATUS FOR CONNECTING COMPUTER DEVICES

Richard S. LaBarbera, Roanoke, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 919,649, Jul. 24, 1992, abandoned. This application Jan. 31, 1995, Ser. No. 381,468

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—309 **32 Claims**



1. An apparatus for use in connecting a first computer device and a second computer device through a dual line cable assembly, the first and second computer devices each having first and second electrical interfaces having a plurality of rows and columns of bus and tag inputs and outputs, comprising:

a first bus and tag sub-assembly including:

a first connector for mating with the first interface in the first device,

a first multi-line cable assembly having a first end and a second end, the first end connected to the first connector,

a first converter adapter connected to the second end of the first multi-line cable assembly and being adapted for connection to the dual line cable assembly,

a second connector connected to the first converter adapter and being mated with the second interface in the first device, and

the first converter adapter including integrated circuit means for (1) multiplexing and then serializing parallel bus and tag information received from the first and second interfaces in the first device and sending such multiplexed serial information over a first line of the dual line cable assembly to the second computer device and (2) deserializing and then demultiplexing serial bus and tag information received through a second line of the dual line cable assembly and sending such parallel and demultiplexed information to the first and second interfaces of the first device.

5,488,706

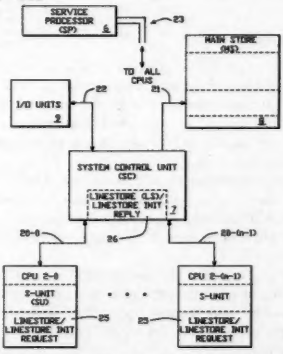
RETRY REQUEST SYSTEM IN A PIPELINE DATA PROCESSING SYSTEM WHERE EACH REQUESTING UNIT PRESERVES THE ORDER OF REQUESTS

Kent Wendorf, San Jose; Ronald N. Hilton, Cupertino; Nicholas Y. Pang, San Mateo; Jeffrey L. Baker, and Kham X. Nguyen, both of Milpitas, all of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Dec. 18, 1992, Ser. No. 993,082

Int. Cl.[6] G06F *9/30;9/28*

U.S. Cl. 395—375 **11 Claims**



1. A retry request control system in a data processing system, said data processing system having a pipeline architecture where the pipeline processes a plurality of overlapping pipeline flows simultaneously, said control system comprising:

first means in a requesting unit within said data processing system for issuing a request during a request flow of said pipeline and for identifying said request as an initial request if no pending requests remain in the pipeline or awaiting a reply from a previously issued request or otherwise as a non initial request;

second means in a control unit within said data processing system for issuing during a reply flow of said pipeline a restart pipeline reply if a request issued during said request flow fails or otherwise a successful reply;

third means in said requesting unit in response to said restart pipeline for causing said request which failed to be reissued by said first means as an initial request;

fourth means in said requesting unit for inhibiting the storage of the results of all requests issued by said first means between the time said first means first issued said failed request and the time said first means reissues said failed request as an initial request; and

said requesting unit preserving the order of the requests issued by said requesting unit when a failed request issued by said requesting unit is retried by said requesting unit independently of said control unit.

5,488,707

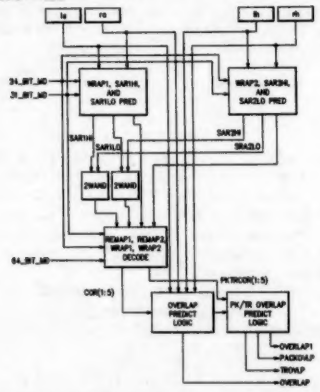
APPARATUS FOR PREDICTING OVERLAPPED STORAGE OPERANDS FOR MOVE CHARACTER

James E. Phillips, Binghamton, and Stamatis Vassiliadis, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 28, 1992, Ser. No. 920,941

Int. Cl.[6] G06F *9/34;12/06*

U.S. Cl. 395—420 **7 Claims**



1. A system to predict destructive overlap between a first operand and a second operand stored in a memory, said first operand including a first base address and a displacement from the first base address and said second storage operand including a second base address and a displacement from the second base address, comprising in combination:

first means responsive to said first base address and to said displacement from the first base address to detect a wrap condition of said first operand in said memory and to detect the presence of said first operand in a high block of said memory;

second means responsive to said second base address and to said displacement from the second base address to detect a wrap condition of said second operand in said memory and to detect the presence of said second operand in a low block of said memory;

means responsive to said first means and said second means to generate an overlap correction factor in predicting a destructive overlap between said first operand and said second operand;

a storage operand overlap predictor responsive to said first base address, said displacement from said first base address, said second base address, said displacement from said second base address, and said overlap correction factor to generate an output indicative of a destructive overlap between said first operand and said second operand.

5,488,708

MEMORY MANAGEMENT IN AN IMAGE PROCESSING APPARATUS WITH DETACHABLE MEMORY

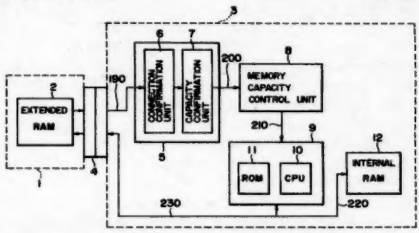
Masao Hayashi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 659,687, Feb. 25, 1991, abandoned. This application Mar. 14, 1994, Ser. No. 209,375

Claims priority, application Japan, Mar. 5, 1990, 2-051648

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—442 **6 Claims**



1. An information processing apparatus which performs a plurality of processings, comprising:

internal memory means;

first definition means for defining areas available for each of the plurality of processings, respectively, in said internal memory means;

connection means for detachably connecting an expansion memory to said apparatus;

detection means for detecting presence or absence of the expansion memory to be connected to said apparatus;

second definition means for defining, in the expansion memory, a fixed size area available for a predetermined one of the plurality of processings and additional areas available for each of the plurality of processing other than the predetermined one, respectively, in response to the detection of the presence of the expansion memory by said detection means; and

processing means for performing each of the plurality of processings of information by utilizing the areas available for respective processings defined by said first definition means in the internal memory means, and by further utilizing the areas in the expansion memory available for the respective processing defined by said second definition means if the expansion memory is connected to said apparatus.

5,488,709

CACHE INCLUDING DECOUPLING REGISTER CIRCUITS

Alfred K. Chan, Milpitas, Calif., assignor to MOS Electronics, Corp., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 546,071, Jun. 27, 1990, abandoned. This application Apr. 1, 1991, Ser. No. 678,912

Int. Cl.[6] G06F *13/00;13/28*

U.S. Cl. 395—445 **26 Claims**

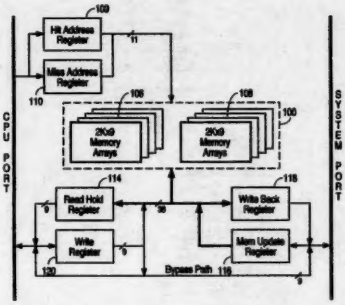
1. A cache memory apparatus comprising:

a random access memory;

a host port;

a system port;

a memory write register for buffering first data received from said host port and selectively providing the first data to one of said random access memory, said system port, and said ran-



dom access memory and said system port, said memory write register being coupled between said host port and said random access memory and between said host port and said system port; and

a write back register for holding second data received from said random access memory and selectively providing the second data to said system port, said write back register being coupled between said random access memory and said system port;

wherein the buffering and selective providing of the first data to said random access memory and the holding and selective providing of the second data to said system port allows memory accesses at said host port to be decoupled from memory accesses at said system port.

5,488,710

CACHE MEMORY AND DATA PROCESSOR INCLUDING INSTRUCTION LENGTH DECODING CIRCUITRY FOR SIMULTANEOUSLY DECODING A PLURALITY OF VARIABLE LENGTH INSTRUCTIONS

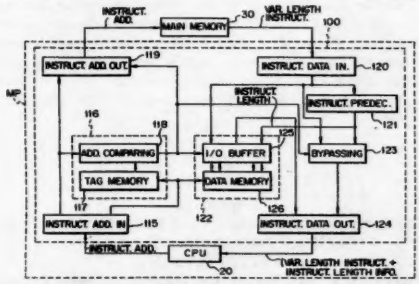
Taizo Sato, and Atsushi Fujihira, both of Kawasaki, Japan, assignors to Fujitsu Limited

Filed Feb. 10, 1992, Ser. No. 833,412

Claims priority, application Japan, Feb. 8, 1991, 3-016716; Feb. 13, 1991, 3-019849

Int. Cl.[6] G06F *12/04;13/00;9/30*

U.S. Cl. 395—452 **14 Claims**



1. A cache memory for storing at least one variable length instruction from a memory and outputting stored information to control means, the cache memory comprising:

instruction length decoding means for decoding an instruction length of the variable length instruction from the memory; and

instruction storing means for storing the variable length instruction from the memory and corresponding instruction length information from the instruction length decoding means, and outputting the variable length instruction and the corresponding instruction length information thereof to the control means, the instruction storing means comprising:

memory means for storing the variable length instruction output from the memory and the corresponding instruction length information from the instruction length decoding means; and

means for reading an instruction and corresponding instruction length information from the memory means when a cache hit occurs indicating the instruction and the corresponding instruction length information are in said memory means and transmitting the instruction and corresponding instruction length information from the memory means to the control means, and for receiving the instruction output from the memory and the corresponding instruction length information from the instruction length decoding means when a cache miss occurs indicating the instruction and the corresponding instruction length information are not in said memory means and writing the received instruction and corresponding instruction length information into the memory means.

5,488,711

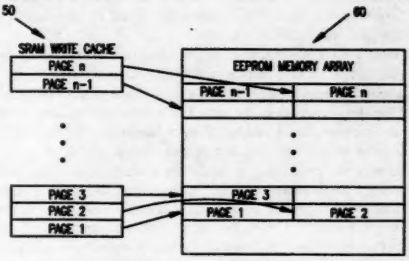
SERIAL EEPROM DEVICE AND ASSOCIATED METHOD FOR REDUCING DATA LOAD TIME USING A PAGE MODE WRITE CACHE

Kent D. Hewitt, Tempe; Samuel E. Alexander, Gilbert, and Richard J. Fisher, Phoenix, all of Ariz., assignors to Microchip Technology Incorporated, Chandler, Ariz.

Filed Apr. 1, 1993, Ser. No. 41,076

Int. Cl.[6] G06F *13/28;13/36;* **G11C** *16/04*

U.S. Cl. 395—430 **5 Claims**



1. A serial EEPROM (electrically erasable programmable read only memory) device having an internal memory array to be written by data sent from a controller on a bus used to carry other data and instructions when the controller is performing other tasks, comprising:

SRAM (static random access memory) write cache means for receiving a burst of data from the controller on the bus, and for storing the received burst of data sequentially and grouped in a plurality of pages,

the internal memory array having a plurality of rows of memory cells for storing data written therein from said SRAM write cache means,

whereby when the internal memory array is being written sequentially from the pages of the SRAM write cache means after all data in the burst of data has been loaded into the SRAM write cache means, the bus is available to carry other data and instructions to permit the controller to perform other processing tasks, and

means for writing the burst of data received by the SRAM write cache means to the memory array of the device in page by page sequence, each page having a size equal to that of the other pages of the SRAM write cache means which allows all of the data contained in a precise integral number of pages of the SRAM write cache means to be stored in a corresponding row of the internal memory array.

5,488,712

MEMORY CIRCUIT WITH PIPELINE PROCESSING

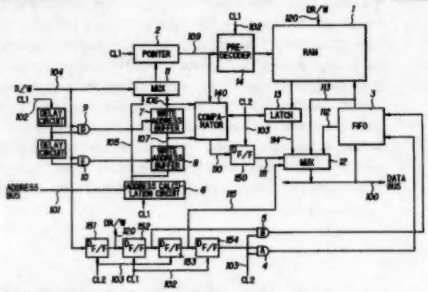
Toyoo Kiuchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 27, 1991, Ser. No. 816,396

Claims priority, application Japan, Dec. 28, 1990, 2-417522

Int. Cl.[6] G06F *13/16;5/06;* **G11C** *7/00*

U.S. Cl. 395—431 **3 Claims**



1. A memory circuit, comprising:

a first-in, first-out (FIFO) type buffer circuit provided between a random access memory and a system data bus, said FIFO type buffer circuit holding data successively supplied from said system data bus in a data writing mode;

an address calculation circuit for calculating an address in accordance with data on an address bus;

an address pointer holding an address for designating an address of said random access memory;

a first selection circuit for selecting one of a read data bus connected to said random access memory and a data bus connected to said FIFO type buffer circuit in response to first and second selection signals;

a shift circuit for holding an address, said shift circuit being connected to said address calculation circuit;

a second selection circuit, connected to said address pointer, for selecting one of an address bus connected to said address calculation circuit and an address bus connected to said shift circuit in response to a read/write control signal;

a circuit for generating a mode designating signal supplied to said random access memory, a first control signal supplied to said FIFO type buffer circuit, said first selection signal supplied to said first selection circuit, and a second control signal supplied to said shift circuit, respectively, in response to said read/write control signal; and

a comparison circuit for comparing said address of said shift circuit and said address of said address pointer to generate said second selection signal supplied to said first selection circuit,

wherein said circuit for generating generates said mode designating signal and said first selection signal by delaying said read/write control signal, said first control signal by logic calculation of a delayed signal which is obtained by delaying said read/write control signal, and said second control signal to be obtained by selectively masking a clock signal.

5,488,713

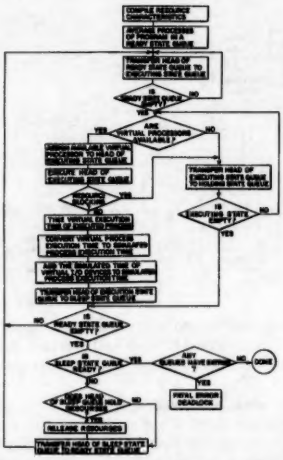
COMPUTER SIMULATION TECHNIQUE FOR PREDICTING PROGRAM PERFORMANCE

Richard L. Norton, and Karen J. Norton, both of Colorado Springs, Colo., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 457,325, Dec. 27, 1989, abandoned. This application Jul. 28, 1993, Ser. No. 98,757

Int. Cl.[6] G06F *9/455*

U.S. Cl. 395—500 **25 Claims**



1. A method for evaluating the execution of a computer program designed to execute on a target computer system using a host computer system having a single processor unit to simulate said target computer system and execute said computer program, comprising the steps of:

configuring system characteristics for said target computer system including characteristics of simulated processors and simulated I/O devices, said target system having a single processor configuration according to one user defined selection and said target system having a multiple processor configuration according to another user defined selection;

executing component processes of said computer program on said host computer with assigned ones of said simulated processors and simulated I/O devices according to said system characteristics for said target computer system;

measuring the virtual process execution time of each of said component processes on said single processor of said host computer system for each of said executed component processes;

converting the measured virtual process execution time of each of said component processes to simulated process execution time proportional to the ratio of the speed of each corresponding one of said simulated processors to the speed of said single processor of said host computer system;

adding the simulated time of each corresponding one of said simulated I/O devices to said simulated process execution time for each of said executed component processes; and

advancing simulated program execution time by said simulated process execution time of each of said executed component processes according to the simulated concurrence of execution of each of said component processes with other ones of said component processes.

5,488,714

COMPUTER PROGRAM ANALYZER FOR ADAPTING COMPUTER PROGRAMS TO DIFFERENT ARCHITECTURES

Wendy C. Skidmore, Wayne, Pa., assignor to Unisys Corporation, Blue Bell, Pa.

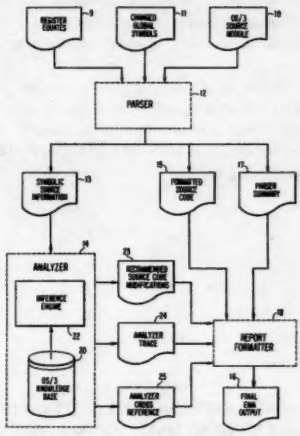
Continuation of Ser. No. 955,226, Oct. 1, 1992, abandoned, which is a continuation of Ser. No. 527,059, May 23, 1990, abandoned. This application Aug. 25, 1993, Ser. No. 112,631

Int. Cl.[6] G06F *3/00*

U.S. Cl. 395—500 **12 Claims**

1. A computer program analyzer for aiding a computer programmer in modifying a computer program to run on a different computer architecture than an architecture for which the program was originally written comprising;

parser means for receiving a computer program in source code form and generating symbolic source information having



source code lines, said source information being organized into hierarchical data structures which partition all source code lines into homogeneous classes characterized by function or instruction type;

a knowledge base containing structures for representing said source code and information on conversion rules for modifying said source code for said different computer architecture;

an inference engine connected to said parser means and knowledge base for receiving said organized symbolic source information and selectively retrieving said conversion rules for applying said conversion rules to said symbolic source information and for generating outputs including recommendations for source code modification, a trace of rules used in arriving at said recommendations and a cross reference of all symbol names used on source lines which have been cited for change; and

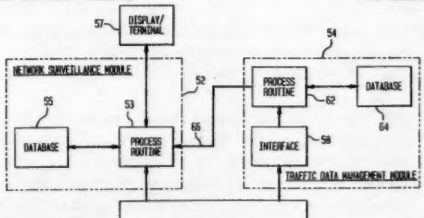
report formatter means connected to said parser means for receiving said organized symbolic source information and to said inference engine for receiving said recommendations, trace and cross reference for generating a report of recommendations for source code modification for use by said programmer.

5,488,715

PROCESS FOR INTEGRATED TRAFFIC DATA MANAGEMENT AND NETWORK SURVEILLANCE IN COMMUNICATIONS NETWORKS

Paul F. Wainwright, Monmouth, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Aug. 1, 1994, Ser. No. 284,019
Int. Cl.[6] G06F *11/34*
U.S. Cl. 395—182.02 **11 Claims**



1. A method for prioritizing maintenance problems in a communications network having a plurality of network elements, comprising:

interfacing with the network elements to gather in real-time and at predetermined time intervals, traffic data corresponding to measured levels of utilization of the plural network elements;

storing said gathered traffic data in a database for subsequent analysis by network planners;

processing said stored traffic data by comparing utilization level measurements obtained during said interfacing step with a predetermined range of acceptable values in order to detect first and second measurements outside of said predetermined range;

said processing step generating first and second traffic data exception messages corresponding to first and second detected measurements outside of said range, said first traffic data exception message indicative of a first traffic abnormality having a first traffic affecting severity level, and said second traffic data exception message indicative of a second traffic abnormality having a second traffic affecting severity level;

comparing, in said processing step, said first traffic affecting severity level to said second traffic affecting severity level and generating a comparison output; and

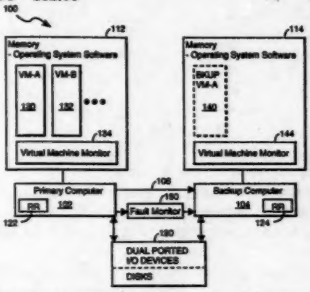
outputting to a message center said first and second traffic data exception messages along with a representation of the traffic affecting severity levels associated therewith and said comparison output, so as to provide maintenance personnel with a priority of maintenance problems requiring repair.

5,488,716

FAULT TOLERANT COMPUTER SYSTEM WITH SHADOW VIRTUAL PROCESSOR

Fred B. Schneider, Ithaca, N.Y.; Butler Lampson, Cambridge; Edward Balkovich, Acton, both of Mass., and David Thiel, Colorado Springs, Colo., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 783,519, Oct. 28, 1991, abandoned.
This application Jan. 14, 1994, Ser. No. 182,311
Int. Cl.[6] G06F *11/34*
U.S. Cl. 395—182.08 **16 Claims**



5. A fault tolerant computer system, comprising:

a primary computer;

a backup computer coupled to said primary computer for communication of messages therebetween; said primary and backup computers each executing a substantially identical stream of instructions;

a fault detector coupled to said primary computer and said backup computer for sending a fault message to said backup computer when said primary computer fails;

said primary computer including:

primary interrupt/trap buffer means for trapping and buffering all interrupts and traps associated with operation of said primary computer, for sending copies of said interrupts to said backup computer, and for delivering said buffered interrupts and traps to said primary computer at predefined points in said stream of instructions executed by said primary computer; and

primary epoch control means for sending a control message to said backup computer each time said primary computer reaches one of said predefined points in said stream of

instructions, wherein said control message indicates which instructions the primary computer has just executed;

said backup computer including:

backup interrupt/trap buffer means for trapping and buffering all traps associated with operation of said backup computer as well as said interrupts sent by said primary computer, and for delivering said buffered interrupts and traps to said backup computer at predefined points in said stream of instructions executed by said backup computer;

backup epoch control means for stopping execution of said stream of instructions by said backup computer at each of said predefined points until said backup computer receives the control message indicating that said primary computer has completed execution of said stream of instructions through a next one of said predefined points in said stream of instructions after the predefined point at which said backup computer is stopped, such that said backup computer's execution of said stream of instructions always lags behind the primary computer's execution of said stream of instructions.

5,488,717

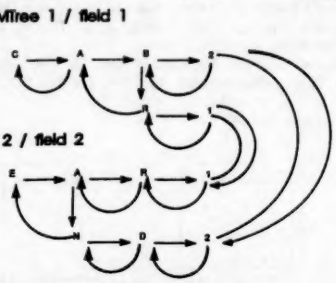
MTREE DATA STRUCTURE FOR STORAGE, INDEXING AND RETRIEVAL OF INFORMATION

Seann Gibson, and Kerr Gibson, both of Columbus, Ohio, assignors to 1st Desk Systems, Inc., Medway, Mass.

Filed Jul. 6, 1992, Ser. No. 909,170

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—600 **21 Claims**



11. A computation system comprising:

(a) an architecture including a central processing unit, a memory means and an operating system;

(b) said operating system being programmed in a machine code language;

(c) a linker for combining a first input and a second input;

(d) a text editor for said operating system to input data units composed of data elements for generation of a source code;

(e) said source code being in a higher level language than said machine code language;

(f) said central processing unit establishing in said memory means a plurality of trees of nodes that are interrelated by a plurality of distributions of pointers;

(g) each of said trees of nodes including predecessor nodes and successor nodes;

(h) each of said distributions of pointers including progressions of next pointers and alternate pointers;

(i) said central processing unit accessing progressions of said nodes in correspondence with progressions of elements of coded data;

(j) each of said progressions of nodes being associated with at least one index, wherein said index gives said progression of nodes the means (1) to locate a progression of nodes in one or more other of said trees and (2) to permit one or more progressions of nodes of other of said tree of nodes to locate said progression of nodes;

(k) selected elements of different data units in selected progressions of successor nodes being different for different data units in order to uniquely identify said different data units; and

(l) selected elements of different data in selected predecessor nodes being common to said different data in order to achieve a high concentration of said data in said memory means and to achieve rapid accessibility of said different data by said central processing unit.

5,488,718

RECORDING AND REPRODUCING METHOD IN WHICH DATA AND UPDATING DATA ARE RECORDED IN A SECTOR OF A SELECTED BLOCK OF A RECORDING MEDIUM IN A PREDETERMINED ORDER WITHOUT RECORDING A DIRECTORY

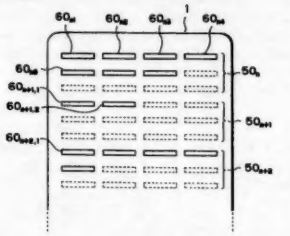
Hirokazu Tanaka, Yokohama, and Keiji Tsuchiya, Kawasaki, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1993, Ser. No. 66,447

Claims priority, application Japan, May 27, 1992, 4-158892

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—600 **4 Claims**



1. A method of recording data on and reproducing data from a recording medium using a recording and reproducing head, the recording medium having a recording surface on which a plurality of sectors are arranged in a predetermined order, said method comprising the steps of:

preparing a plurality of blocks on the recording surface of the recording medium, each of the blocks corresponding to the contents of recording data and each including a plurality of sectors;

selecting a block, which corresponds to the content of data to be recorded, from among the plurality of blocks;

moving the recording and reproducing head to the selected block;

recording data by the recording and reproducing head on at least one sector in the selected block in accordance with a predetermined order, without recording a directory;

additionally recording updating data by the recording and reproducing head in accordance with a predetermined order in at least one sector subsequent to the sector recorded in the selected block, without recording a directory; and

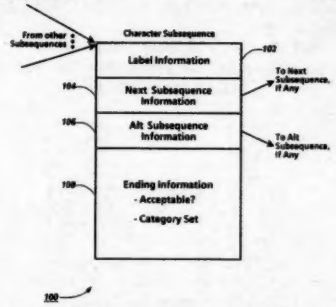
reading out the data from at least one sector lastly recorded in the selected block, as only data indicating the content of the data corresponding to the selected block.

5,488,719

SYSTEM FOR CATEGORIZING CHARACTER STRINGS USING ACCEPTABILITY AND CATEGORY INFORMATION CONTAINED IN ENDING SUBSTRINGS

Ronald M. Kaplan, Palo Alto, Calif.; Robert Shuchatowitz, Brighton, Mass., and Atty T. Mullins, Tucson, Ariz., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 30, 1991, Ser. No. 814,552
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—600 **23 Claims**



1. An article, of manufacture for use in a character recognition system that includes a processor; the article comprising:

a data storage medium; and

string data stored by the data storage medium; the string data comprising two or more data units, each of which can be accessed by a processor of a character recognition system; the data units including, for each of a set of two or more acceptable strings of characters, a respective sequence of data units that the processor can access using character data indicating character types of the string's characters;

the set of acceptable strings including a first string that is in a first subset of categories, each category in the first subset being one of a set of two or more categories; the first string's sequence of data units including a respective ending subsequence of data units that the processor can access at the end of the first string's sequence and use to obtain first string ending data indicating that the first string is one of the acceptable strings and indicating the first subset of categories; the first string's ending subsequence including:

acceptance information indicating that a string at the end of whose respective sequence the processor can access the ending subsequence is one of the set of acceptable strings; and

category set information indicating the first subset of categories; the first subset of categories including at least one of the set of categories.

5,488,720

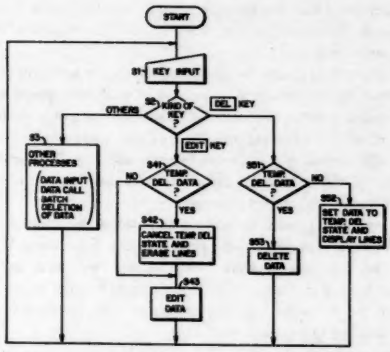
APPARATUS WITH DELETION SAFEGUARD FOR SETTING A NUMBER OF DATA IN TEMPORARY DELETION STATE AND INDEPENDENTLY RELEASING OR DELETING ANY ONE OF THE DATA

Kenichi Inui, Kitakatsuragi, Japan, assignor to Sharp Kabushiki Kaisha, Japan

Continuation of Ser. No. 548,413, Jul. 5, 1990, abandoned.
This application Feb. 8, 1995, Ser. No. 385,581
Claims priority, application Japan, Jul. 7, 1989, 1-176343
Int. Cl.[6] G06F *17/00*
U.S. Cl. 395—600 **10 Claims**

1. An electronic apparatus comprising a display, control means, and memory means under the control of the control means, the control means being responsively connected to a plurality of input keys, wherein said control means comprises:

temporary deletion means, responsive to a first predetermined key operation, for independently setting any number of desired data which are stored in said memory means into a temporary deletion state at any one time;



deletion means, responsive to a second predetermined key operation, for independently deleting any one of said desired data which have been set into the temporary deletion state from said memory means while maintaining other desired data in the temporary deletion state;

temporary deletion indication means for providing a visual indication, to be displayed with said desired data when any one of said desired data is displayed on the display, which indicates that said desired data is in the temporary deletion state; and

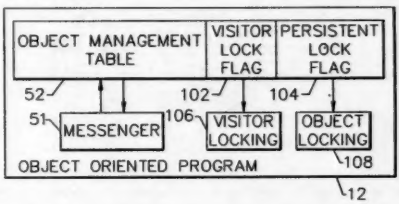
release means, responsive to a third predetermined key operation, for independently releasing the temporary deletion state of any number of said desired data which have been set into the temporary deletion state while maintaining other desired data in the temporary deletion state.

5,488,721

SYSTEM AND METHOD FOR APPLYING VISITOR LOCK AND PERSISTENT LOCK FLAGS TO CONTROL UNITS OF WORK BOUNDARIES IN AN OBJECT ORIENTED ENVIRONMENT

William L. Rich, Stone Mountain, and Floyd W. Shackelford, Beauford, both of Ga., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 9,580, Jan. 26, 1993, abandoned.
This application May 19, 1995, Ser. No. 444,654
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—600 **20 Claims**



1. An object management system for an object oriented computing environment on a computing platform, said object oriented computing environment including a plurality of objects each including an object frame containing data attributes, and at least one object method for performing actions on the associated object, at least some of said objects being organized into a plurality of units of work, such that the objects in a unit of work are manipulated as a group to perform a task, said object management system comprising:

an object management table, including a listing of said plurality of units of work and pointers to the objects contained therein, said object management table further including a visitor lock flag for each of said plurality of units of work, each visitor lock flag being in one of a first state and a second state, and a

persistent lock flag for each of said plurality of units of work, each persistent lock flag being in one of a first state and a second state;

visitor locking means for preventing copying of an object from a first unit of work to a second unit of work in response to the visitor lock flag associated with said first unit of work being in said first state, and for allowing copying of said object from said first unit of work to said second unit of work in response to the visitor lock flag associated with said first unit of work being in said second state; and

object locking means for locking an object within said first unit of work in response to the persistent lock flag associated with said first unit of work being in said first state, and for unlocking said object from said first unit of work in response to the persistent lock flag associated with said first unit of work being in said second state.

5,488,722

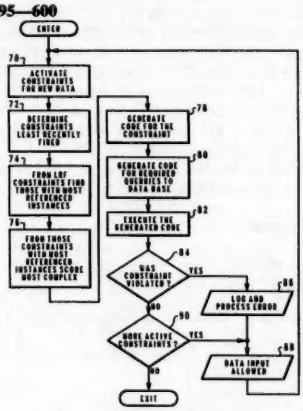
SYSTEM AND METHOD FOR AUTOMATING IMPLEMENTATION AND EXECUTION OF CONSTRAINT MOST LIKELY TO BE VIOLATED IN A DATABASE

Thomas E. Potok, Apex, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 28, 1993, Ser. No. 68,820

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—600 **12 Claims**



1. A method for operating a computer to update an entity-relationship model database, the method comprising the steps performed by the computer of:

accepting data for a new or modified instance or to delete an instance of an entity;

activating constraints applicable to the accepted data;

determining a firing order including at least a first constraint for firing from among the activated constraints, the first constraint being determined based on criteria which attempts to identify a constraint most likely to be violated;

firing the first constraint;

determining if the first constraint was violated; and

returning to the step of activating constraints if any constraints remain to be fired.

5,488,723

SOFTWARE SYSTEM HAVING REPLICATED OBJECTS AND USING DYNAMIC MESSAGING, IN PARTICULAR FOR A MONITORING/CONTROL INSTALLATION OF REDUNDANT ARCHITECTURE

Christophe Baradel, Paris; Yves Eychenne, Limours, and Bruno Kohen, Paris, all of, France, assignors to Cegelec, Levallois-Perret, France

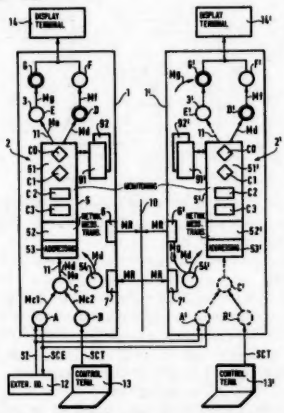
PCT No. PCT/FR93/00499, § 371 Date Jan. 24, 1994, § 102(e) Date Jan. 24, 1994, PCT Pub. No. WO93/24884, PCT Pub. Date Dec. 9, 1993

PCT Filed May 24, 1993, Ser. No. 185,859

Claims priority, application France, May 25, 1992, 92 06372

Int. Cl.[6] G06F *15/16*

U.S. Cl. 395—700 **4 Claims**



1. In a monitoring/control installation comprising: a first processor (1) acting as a primary processor for running a first object-oriented program (2) having first objects (A,B,C,D,E,F,G) and a first dynamic object messaging mechanism (5), and a second processor (1') connected to said first processor via a communication network (10), said second processor acting as a backup processor for running a second object-oriented program (2') having second objects (A',B',C',D',E',F',G') and a second dynamic object messaging mechanism (5') with said second objects being replicas of at least certain ones (D,G) of said first objects which encapsulate non-volatile data,

a method for maintaining consistency between said certain ones of said first objects in said first processor and said second objects in said second processor during runtime of said first program, said method comprising the steps of:

providing a mark to each of said first objects, said mark being retrievable from processing of an operation invocation on said first objects via said first dynamic object messaging mechanism;

setting the mark of said certain ones of said first objects with a specific value;

in said first dynamic object messaging mechanism,

detecting (51,C1), from each operation invocation on one of said a first objects, whether said one of said first objects has a mark set with said specific value,

when said one of said first objects has a mark not set with said specific value, performing (53) the processing of said operation invocation on said one of said first objects,

when said one of said first objects has a mark set with said specific value, broadcasting (52) an object call message corresponding to said operation invocation on said one of said first objects via said communication network for time delaying said object call message at an input of said first processor and said second processor by using an atomic and ordered broadcast protocol, and

retrieving (54), from said communication network, object call messages and processing said object call messages to perform a succession of corresponding operation invocations on said first objects; and

in the second dynamic object messaging mechanism,

retrieving (54'), from said communication network, object call messages, and

processing said object call messages to perform a succession of corresponding operation invocations on said second objects, so that the successive operations on said certain ones of said first objects in said first processor and the successive operations on the replicas of said certain ones of said first objects in said second processor are performed in the same order.

5,488,724

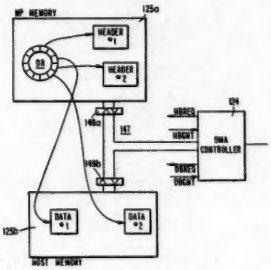
NETWORK CONTROLLER WITH MEMORY REQUEST AND ACKNOWLEDGEMENT SIGNALS AND A NETWORK ADAPTER THEREWITH

Farzin Firoozmand, Cupertino, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 529,362, May 29, 1990, Pat. No. 5,136,582. This application May 15, 1992, Ser. No. 883,748

Int. Cl.[6] G06F *13/16*

U.S. Cl. 395—200.07 **20 Claims**



1. A network controller for a local system coupled to a network, said local system including a plurality of processors and at least first and second memories for storing data arranged in buffers, said first and second memories respectively being on first and second busses and said first and second busses being connected to a third bus, the network controller comprising:

network DMA controller means on said third bus for sending thereon one or the other of a first memory request signal and a second memory request signal to said first and second memories in response to signals from one of said plurality of processors;

means coupled to said first bus and responsive only to said first memory request signal for sending a first memory acknowledgement signal to the DMA controller;

means coupled to said second bus and responsive only to said second memory request signal for sending a second memory acknowledgement signal to the DMA controller; and

wherein said network DMA controller means includes means for accessing only the selected one of said first memory and second memory in response, respectively, to said first memory acknowledgement signal or said second memory acknowledgement signal.

5,488,725

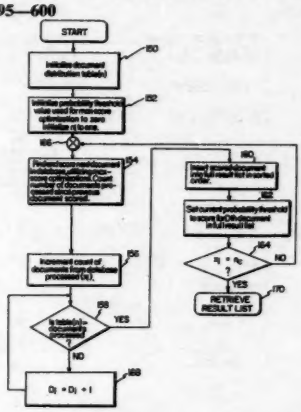
SYSTEM OF DOCUMENT REPRESENTATION RETRIEVAL BY SUCCESSIVE ITERATED PROBABILITY SAMPLING

Howard R. Turtle, Rosemount; Gerald J. Morton, South St. Paul, and F. Kinley Larntz, Shoreview, all of Minn., assignors to West Publishing Company, Eagan, Minn.

Continuation-in-part of Ser. No. 773,101, Oct. 8, 1991, Pat. No. 5,265,065. This application Mar. 30, 1993, Ser. No. 39,757

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—600 **46 Claims**



1. In a computer system for identifying a predetermined number of documents of a document collection containing representations that have high probabilities of matching a query containing a plurality of concepts, in which the system has a database containing identifications of documents in the document collection and defining a plurality_ of representations representing the contents of the documents, the collection comprising a plurality_ of documents, and query means for defining the query, apparatus comprising:

sample selection means for iteratively selecting successive samples of a plurality of documents from the collection, each sample containing fewer documents than the entire collection and each successive sample containing documents different from each previous sample;

processing means responsive to the sample selection means for calculating, during each iteration, probabilities that documents contained in the sample contain representations that match the query and for identifying a preselected number of documents having the highest probabilities, the documents being identified during an iteration from a group consisting of the respective sample of documents and the documents identified during the next previous iteration, the preselected number being different for each iteration and no greater than the predetermined number; and

output means outputting the identifications of the predetermined number of documents identified by the processing means.

5,488,726

Patent Not Issued For This Number

5,488,727

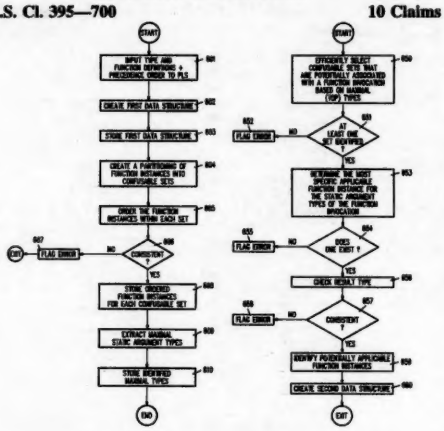
METHODS TO SUPPORT MULTIMETHOD FUNCTION OVERLOADING WITH COMPILE-TIME TYPE CHECKING

Rakesh Agrawal, San Jose; Linda G. De Michiel, Los Altos, and Bruce G. Lindsay, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1991, Ser. No. 771,376

Int. Cl.[6] G06F *9/45;11/00*

U.S. Cl. 395—700 10 Claims



1. A method, to be practiced at compile time by a data handling system that supports multimethod function selection on typed data, including subtypes with multiple inheritance, for enabling static-type checking to be performed at run time for overloaded functions, wherein said system includes (i) a set of type definitions, including specification of subtype relationships, (ii) function definitions referring to at least one of the type definitions, each function definition including a definition of arguments, including an argument order and argument positions, and (iii) precedence rules which, in combination with the function argument order, define an ordering of the confusable function instances, for a given set of arguments, the method comprising the steps of:

(a) creating from said type definitions a first data structure for representing subtype relationships between data types, the subtype relationships including levels of specificity, such that, within a given subtype relation for a given set of the data types, there is a maximal static argument type which has a lowest level of specificity;

(b) creating from said first data structure and said function definitions a partitioning of function instances into confusable sets;

(c) ordering the function instances within each confusable set;

(d) verifying consistency among the ordered function instances resulting from said step of ordering;

(e) identifying any consistency errors with respect to said ordered function instances;

(f) signaling an error condition upon the identification of any such consistency error;

(g) extracting, for each confusable set, information as the maximal static argument types of the functions are for each of the argument positions; and identifying confusable sets of function instances as confusable sets which potentially contain all functions applicable to the function invocation, the applicable functions having arguments, the arguments having argument types which are supertypes or subtypes of the compile time argument types of the function invocation;

whereby, one of the applicable functions is chosen for execution at run time, in accordance with actual types of the function arguments.

5,488,728

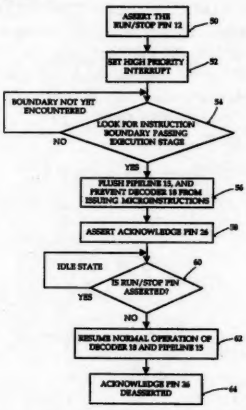
MICROPROCESSOR HAVING A RUN/STOP PIN FOR ACCESSING AN IDLE MODE

Robert S. Dreyer, Sunnyvale, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 101,783, Aug. 3, 1993, abandoned, which is a continuation of Ser. No. 874,716, Apr. 27, 1992, abandoned. This application Oct. 31, 1994, Ser. No. 332,373

Int. Cl.[6] G06F *15/46*

U.S. Cl. 395—726 19 Claims



1. A method of operating a microprocessor having an external R/S pin, an execution unit, and a decoder and microcode sequencer coupled to said execution unit, said microprocessor having a processor state associated therewith during operation, said microprocessor executing a sequence of macroinstructions, each of said macroinstructions being decoded by said execution unit and when execution is completed, then the processor state is updated responsive to the completed instruction, said method comprising:

a) asserting the R/S pin by assertion of an external signal while said microprocessor is executing a macroinstruction that has been decoded into one or more instructions;

b) continuing executing said one or more microinstructions until execution of the currently executing macroinstruction is complete and the processor state is updated responsive to said macroinstruction, and then halting execution of said microinstructions within said execution unit, thereby halting microprocessor execution at a macroinstruction boundary;

c) following said step b, flushing the execution unit of all microinstructions that are currently in the pipeline; and

d) while said R/S pin remains asserted subsequent to step c, signaling the decoder and microcode sequencer so that said decoder and microcode sequencer are not allowed to issue any microinstructions to the execution unit.

5,488,729

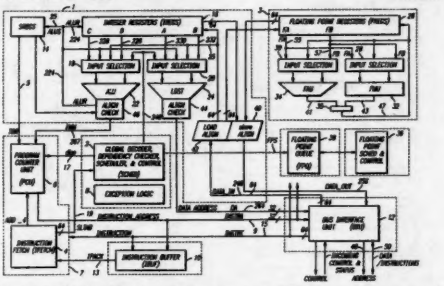
CENTRAL PROCESSING UNIT ARCHITECTURE WITH SYMMETRIC INSTRUCTION SCHEDULING TO ACHIEVE MULTIPLE INSTRUCTION LAUNCH AND EXECUTION

Anantakotiraju Vegesna; Jayachandra B. Avula; Peter H. Jewett, and Yatin G. Mundkur, all of Austin, Tex., assignors to Ross Technology, Inc., Austin, Tex.

Continuation of Ser. No. 701,142, May 15, 1991, abandoned. This application Mar. 7, 1994, Ser. No. 208,091

Int. Cl.[6] G06F *15/16;9/28;9/38*

U.S. Cl. 395—800 7 Claims



1. A method of using a processor to execute a sequence of instructions, the processor issuing none, one or more of the instructions for execution at the start of each cycle of a clock signal, the processor comprising a plurality of execution resources, each of which is associated with one of a plurality of pipelines, each of the instructions being classified according to which of the plurality of resources is appropriate for executing each of the instructions, each of the instructions being processed within an appropriate one of the plurality of pipelines the appropriate one of the plurality of pipelines for each of the instructions being associated with the appropriate of the plurality of execution resources for executing each of the instructions, said method comprising the steps of:

fetching one or more of the sequence of instructions, said step of fetching further comprising the step of grouping two or more of the fetched instructions into a packet;

dynamically scheduling the instructions of the packet for execution, said step of dynamically scheduling further comprising the steps of:

globally decoding each of the instructions of the packet to produce an initial characterization of each, the initial characterization including the classification of each of the instructions of the packet;

detecting resource conflicts between or among the instructions of the packet using the initial characterization of each;

detecting intrapacket dependencies between or among the instructions of the packet using the initial characterization of each;

detecting interpacket dependencies between one or more of the instructions of the packet and one or more of the instructions of the sequence currently being processed ahead of the instructions of the packet and within two or more of the plurality of pipelines; and

resolving any detected resource conflicts, intrapacket dependencies and interpacket dependencies to identify which of the instructions of the packet can be executed at the start of next cycle of the clock signal;

initiating execution of the identified instructions of the packet at the start of the next cycle of the clock signal;

wherein each of the two or more of the plurality of pipelines comprises a series of stages the series of stages including an instruction fetch stage, an instruction decode stage, and at least one instruction execute stage, each of the series of stages having a time duration equal to at least one cycle of the clock signal;

wherein said step of dynamically scheduling is performed within the instruction decode stage; and

wherein said step of dynamically scheduling is performed in less than one cycle of the clock signal such that the duration of one cycle of the clock signal is dictated by functions of the processor other than said step of dynamically scheduling.

5,488,730

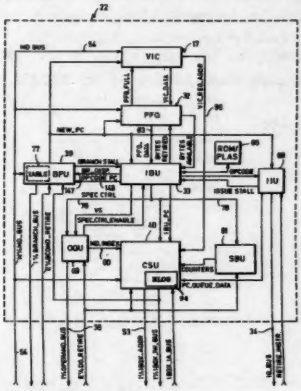
REGISTER CONFLICT SCOREBOARD IN PIPELINED COMPUTER USING PIPELINED REFERENCE COUNTS

John F. Brown, III, Northborough, and Mary K. Gowan, Framingham, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation-in-part of Ser. No. 547,804, Jun. 29, 1990, Pat. No. 5,394,529. This application Aug. 21, 1992, Ser. No. 934,351

Int. Cl.[6] G06F *9/38*

U.S. Cl. 395—800 20 Claims



16. A digital computer comprising:

an instruction unit for decoding instructions;

an execution unit coupled to said instruction unit for executing the instructions decoded by said instruction unit;

a set of general purpose registers coupled to said execution unit for providing source and destination operands during execution of the instructions decoded by said instruction unit;

a complex specifier unit coupled to said instruction unit and said general purpose registers for receiving complex specifiers decoded from said instructions by said instruction unit, said complex specifiers specifying contents of general purpose registers needed for fetching operands from memory, and changes to be made to the contents of said general purpose registers prior to execution of said instructions by said execution unit, and for making the specified changes to the contents of said general purpose registers prior to execution of said instructions by said execution unit; and

means coupled to said complex specifier unit and to said execution unit for preventing register access conflict between said execution unit and said complex specifier unit, said means for preventing register access conflict including:

for each general purpose register, a source counter for counting decoded register source specifiers that specify source operands not yet read from said each general purpose register for use by said execution unit;

for each general purpose register, a destination counter for counting decoded destination specifiers that specify said each general purpose register as a destination for results not yet written into said each general purpose register from said execution unit;

means coupled to said source counters and said complex specifier unit for preventing said complex specifier unit from reading from each general purpose register having a non-zero count of decoded register source specifiers that specify source operands not yet read from said each general purpose register for use by said execution unit; and

means coupled to said source counters and said complex specifier unit for preventing said complex specifier unit

from writing to each general purpose register having a non-zero count of decoded register destination specifiers that specify said each general purpose register as a destination for results not yet written into said each general purpose register from said execution unit.

5,488,731

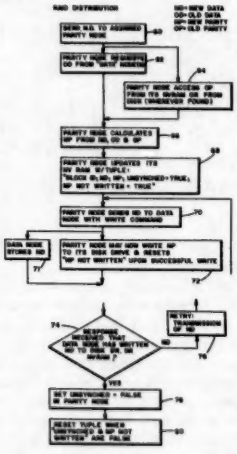
SYNCHRONIZATION METHOD FOR LOOSELY COUPLED ARRAYS OF REDUNDANT DISK DRIVES

Noah Mendelsohn, Arlington, Mass., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 924,219, Aug. 3, 1992, abandoned. This application Dec. 8, 1994, Ser. No. 352,428

Int. Cl.[6] G06F *11/00*

U.S. Cl. 395—800 **13 Claims**



1. A multiprocessor system including a plurality of substantially identical nodes interconnected through a switch network, each node comprising disk drive means, nonvolatile random access memory (NVRAM) and a processor, said multiprocessor system storing RAID-structured data across disk drive means in a plurality of different nodes, said system performing a method comprising the steps of:

a. listing at least an identifier of a data segment to be updated by received update data in an NVRAM in a first node in response to a command to write said update data to said data segment;

b. sending said update data from said first node to a second node containing a copy of said data segment;

c. removing said listing of said identifier in said NVRAM in said first node only when said update data is written to disk drive means in said first node and after receiving a signal that said second node has recorded said update data;

d. causing each node, in the event of a power-up, to scan its NVRAM to find any listed identifiers of data segments contained therein; and

e. for any data segment denoted by a listed identifier in said NVRAM in said first node, causing a corresponding data segment in said second node to be in synchronism with said data segment denoted by said listed identifier in NVRAM in said first node.

5,488,732

AUTOMATIC SUPPORT TOOL GENERATING SYSTEM BASED ON A KNOWLEDGE ACQUISITION TOOL AND A DATABASE

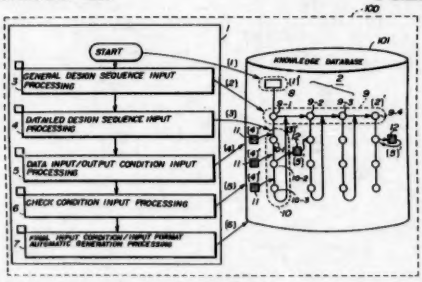
Tadamitsu Ryu; Gen Kakehi, and Shigeru Aoe, all of Kawasaki, Japan, assignors to Fujitsu Network Engineering Limited, Kawasaki, Japan

Continuation of Ser. No. 778,442, Oct. 17, 1991, abandoned. This application Oct. 24, 1994, Ser. No. 328,572

Claims priority, application Japan, Jan. 18, 1990, 2-280335

Int. Cl.[6] G06F *15/20;15/40*

U.S. Cl. 395—800 **8 Claims**



1. A data processing system comprising:

an automatic support tool generating system generating an automatic support tool making a design, comprising a specification, from a general design, said automatic support tool comprising:

a database comprising knowledge data groups storing knowledge as data, each knowledge data group comprising:

a design support tool name corresponding to the general design;

attribute data comprising macro attribute data, in turn comprising micro attribute data,

input/output conditions related to the micro attribute data, said input/output conditions being stored in a relational type structure,

check conditions linking the micro attribute data together, said check conditions being stored in a hyper type structure, and

a design support knowledge data group corresponding to the micro attribute data; and

a knowledge acquisition tool, coupled to the database, generating questions and inputting answers comprising the general design, the attribute data, the input/output conditions, and check conditions, to the questions, and acquiring the knowledge from the answers, said knowledge acquisition tool comprising:

general design sequence input processing means for inputting and storing in the database the general design comprising the macro attribute data and mutual relationships of the macro attribute data,

detailed design sequence input processing means for inputting and storing in the database the micro attribute data,

data input/output condition input processing means for inputting and storing in the database the input/output conditions, and

check condition input processing means for inputting and storing in the database the check conditions, wherein the automatic support tool generating system repeatedly generates the questions and inputs the answers until the general design, the attribute data, the input/output conditions, and the check conditions needed by the automatic support tool generating system to generate the design are input, the automatic design tool adding, modifying, and deleting the attribute data, and link data linking the name, the macro attribute data, the micro attribute data, the input/output conditions, and the check conditions are stored within a link data file, form a network structure, and are extracted to produce an output of the automatic design support tool generating system.

5,488,733

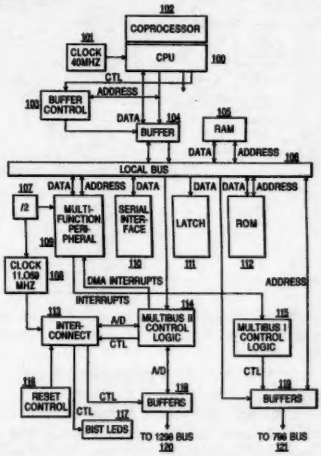
PROPULSION CONTROL SYSTEM CENTAL PROCESSING UNIT BOARD

William F. Molyneaux, Huntington, Pa., assignor to AEG Transportation Systems, Inc., Pittsburgh, Pa.

Division of Ser. No. 686,927, Apr. 18, 1991, Pat. No. 5,377,356, which is a continuation of Ser. No. 584,933, Sep. 19, 1990, abandoned. This application Aug. 30, 1994, Ser. No. 297,845

Int. Cl.[6] G06F *13/28;13/36*

U.S. Cl. 395—800 **2 Claims**



1. A propulsion control system for controlling a vehicle, said propulsion control system comprising:

a field connector interface board connected to vehicle wiring;

a plurality of master and slave interface and control boards connected to the field connector interface board, said plurality of master and slave interface and control boards including a digital input-output board, an analog input-output board, a bitbus board, a tach reader board, a memory board, and a master CPU board, each of which are connected to the field connector interface board;

a first bus connected to the plurality of master and slave interface and control boards and a second bus connected to the master CPU board;

wherein, the master CPU board comprises:

a local bus;

memory;

a multifunction peripheral device; and

a central processing unit operatively connected to said memory and said multifunction peripheral device by said local bus,

with said multifunction peripheral device including:

wait state generator means for generating timing signals,

direct memory access control means for controlling data transfer in said system, and

interrupt handling means for generating interrupt requests and handling direct memory access interrupts;

a first bus interface, operatively connected to said multifunction peripheral device and said local bus, including:

first bus master control logic means for controlling the first bus responsive to said interrupt requests from said interrupt handling means; and

buffering means for buffering data between said local bus and the first bus responsive to said first bus control logic means; and

a second bus interface, operatively connected to said multifunction peripheral device, including:

second bus master control logic means for controlling the second bus and producing said direct memory access interrupts;

interconnect means for interfacing control signals from said second bus control logic means;

reset control having an output connected to said interconnect means; and

buffering means for buffering data between the second bus and said second bus control logic means responsive to control signals from said interconnect means;

with said central processing unit circuit board communicating with the remaining components of said propulsion control system via said first and said second buses.

5,488,734

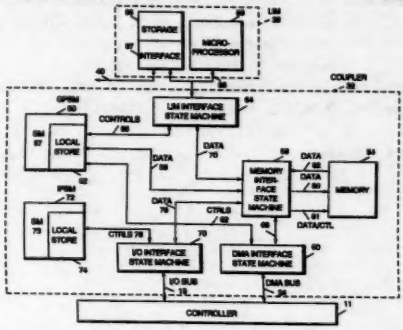
COUPLER FOR PROVIDING A HIGH SPEED INTERFACE BETWEEN A COMMUNICATION CONTROLLER AND A CONTROLLER EXTENSION

Warren D. Bailey, Pittsboro; Kenenth J. Barker; Joan M. Bellinghausen, both of Cary; George M. Calhoun, Raleigh, all of N.C.; Bernard J. Naudin, Saint Laurent Du Var, and Edward Suffern, Vence, both of, France, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 909,887, Jul. 7, 1992, abandoned. This application Nov. 3, 1994, Ser. No. 333,932

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—800 **5 Claims**



1. A coupler, for use in a communication system having a communication controller and a controller extension, for transferring individual segments of data at a high speed between the communication controller and the controller extension, the coupler for being connected to the communication controller by a first bus and a second bus and to the controller extension by a third bus, the coupler comprising:

a.) a memory for temporarily storing commands and data segments received from the first bus, the second bus and the third bus;

b.) means, connected between the second bus and the memory (element a) for retrieving and temporarily storing commands from the second bus and sending commands to the second bus;

c.) a first picoprocessor connected to the memory (element a) and to the second bus retrieving and sending means (element b) for retrieving from the second bus retrieving and sending means (element b) commands received from the second bus and placing the received commands in a queue in the memory (element a);

d.) means, connected between the first bus and the memory (element a), for retrieving data segments from the first bus and sending the data segments to the memory and for retrieving data segments from the memory and sending the data segments to the first bus;

e.) means, connected between the third bus and the memory (element a) for retrieving data segments from the third bus and sending the data segments to the memory and for retrieving data segments from the memory and sending the data segments to the third bus;

f.) the memory (element a), the first bus retrieving and sending means (element d), and the third bus retrieving and sending

means (element e) comprising a main data path over which the data segments pass between the first bus and the third bus; and

g.) a second picoprocessor, located logically out of the main data path, connected to the memory (element a), the first bus retrieving and sending means (element d), and the third bus retrieving and sending means (element e), for managing and controlling the flow of the data segments over the main data path in response to the queued received commands from the second bus.

5,488,735

OPTICAL INTERCONNECTION SUITABLE FOR HIGHLY PARALLEL COMPUTER SYSTEM

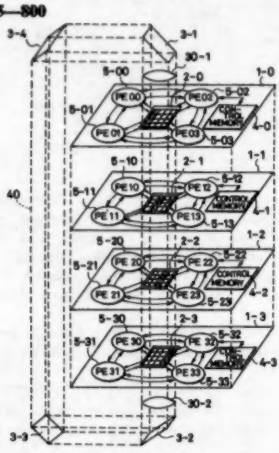
Noboru Tanabe; Shigeru Oyanagi; Shinichi Baba; Katsuji Kaminishi, all of Kanagawa; Masaru Nakamura, Saitama, and Kazunori Sekido, Kanagawa, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 26, 1992, Ser. No. 906,220

Claims priority, application Japan, Jun. 29, 1991, 3-159209; Sep. 30, 1991, 3-252631; Nov. 7, 1991, 3-291646

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—800 **41 Claims**



40. A highly parallel computer system, comprising:

a plurality of processor boards;

a plurality of processor elements provided on each of said processor boards;

a plurality of optical devices, one optical device being provided on each of said processor boards, each optical device on each processor board being connected with processor elements provided on each processor board and including a plurality of optical element cells for intercepting light signals from a first side of said optical device, transmitting intercepted light signals to a second side of said optical device, and emitting light signals to said second side of said optical device; and

a continuous ring shaped optical path for optically connecting all of said optical devices such that light signals coming from a second side of one optical device are intercepted at a first side of another optical device.

5,488,736

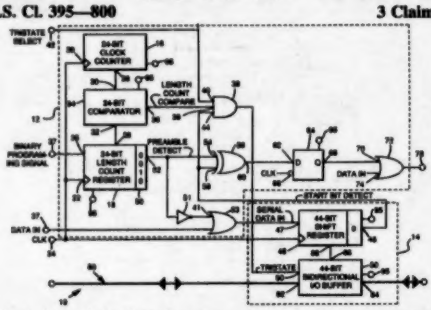
BIDIRECTIONAL PROGRAMMABLE I/O DRIVER ARRAY

Kimberly W. Keech, Brea, and Robert J. Rothaus, Yorba Linda, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 676,604, Mar. 28, 1991, abandoned. This application Jul. 13, 1994, Ser. No. 274,653

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—800 **3 Claims**



1. A daisy-chained configuration of at least two programmable bidirectional input/output drivers, said daisy-chained configuration comprising:

first and second bidirectional input/output (I/O) drivers, each driver including:

an array of bidirectional current buffers, each current buffer having a direction control signal input terminal and first and second I/O terminals, said array further including a direction control signal register for receiving and storing direction control signals for controlling a direction of propagation of data between said first and second I/O terminals, said direction control inputs being connected to data output terminals of the direction control signal register;

a tristate control signal input for receiving an externally generated tristate control signal;

program control circuit means having a data input terminal connected to receive a binary coded programming signal and a data output terminal, said circuit means for generating a plurality of direction control signals in response to the binary coded programming signal, said programming signal includes a header data portion including a preamble code and program length data, said programming signal further including direction control data, the program control circuit means including a length count register means for receiving the header data portion, the length count register means including means for generating a preamble detect signal in response to reception of the header data portion;

wherein the direction control inputs of the bidirectional current buffers are connected to the direction control register for receiving the direction control signals, and the current buffers are individually responsive to individual ones of the direction control signals to transmit data signals in a selected direction;

said program control circuit means further including logic circuit means responsive to said preamble detect signal for permitting said direction control signal to be loaded into said direction control signal register only after receipt of said preamble, said logic circuit means connected to the length counter register and the data input terminal for controlling the loading of direction control data in the direction control register and transmitting of the direction control signals from the direction control register to the direction control signal inputs of the array of bidirectional current buffers;

wherein the array of bidirectional current buffers further includes a tristate control signal input port connected to the tristate input through the program control circuit means for receiving the tristate control signal; and

wherein the array of bidirectional current buffers is operable in a tristate mode in response to the tristate control signal; and

wherein said first and second drivers are connected together in a programming signal daisy chain so that said data input terminal of the second driver is connected to the data output terminal of the first driver, said header data portion of said programming signal is propagated to said first and second drivers, and said drivers are controlled by information in said header data portion so that said first driver receives and acts on direction control data specific to the driver array of said first driver from said programming signal to program the driver array of the first driver, and said second driver receives and acts on direction control data specific to the driver array of the second driver from said programming signal to program the driver array of the second driver.

5,488,737

LAND-BASED WIRELESS COMMUNICATIONS SYSTEM HAVING A SCANNED DIRECTIONAL ANTENNA

Steven A. Harbin, Grover, and Brian K. Rainer, Chesterfield, both of Mo., assignors to Southwestern Bell Technology Resources, Inc., St. Louis, Mo.

Filed Nov. 17, 1992, Ser. No. 977,635

Int. Cl.[6] H04Q *7/20;* **H04B** *7/00*

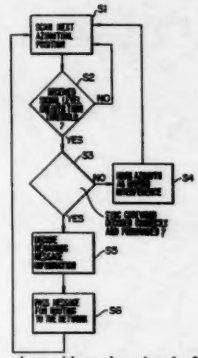
U.S. Cl. 455—33.1 **40 Claims**

1. A radio communications system, comprising:

one or more remote stations, each of said remote stations comprising means for transmitting an identifying signal pattern and message information within a frequency band;

a base station for transmitting and receiving signals to and from said remote stations, said base station comprising at least one receiving antenna coupled to a base station receiver which monitors said frequency band, said at least one receive antenna having a directional pattern in a horizontal plane and means for scanning said directional pattern azimuthally;

means for filtering a signal received at said at least one receive antenna



means for processing said receive signal after filtering by said filtering means, said processing means comprising means for decoding information which is included in said received signals;

means for monitoring a signal strength of said received signal; and

means for controlling said scanning means; wherein said decoding means comprises means for decoding said identifying signal pattern, said system further comprising:

means for determining if said identifying signal pattern has been correctly decoded; and

means for decoding remaining portions of said received signal and forwarding a corresponding message to a network, if it is determined by said determining means that said identifying signal pattern has been correctly decoded;

said means for controlling said scanning means further comprising means for instructing said scanning means to move said directional pattern from one azimuthal position to another if said identifying signal pattern has not been correctly decoded.

DESIGNS

JANUARY 30, 1996

366,551

FROZEN CONFECTION

Connie A. Kellogg, and Daryl D. Spors, both of Green Bay, Wis., assignors to Good Humor Corporation, Green Bay, Wis.

Filed Feb. 10, 1995, Ser. No. 34,689

Term of patent 14 years

U.S. Cl. D1—102

366,552

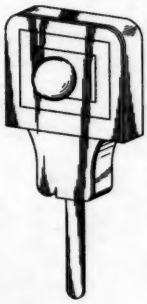
FROZEN CONFECTION

Connie A. Kellogg, and Daryl D. Spors, both of Green Bay, Wis., assignors to Good Humor Corporation, Green Bay, Wis.

Filed Feb. 10, 1995, Ser. No. 34,783

Term of patent 14 years

U.S. Cl. D1—102



366,553

NECKTIE

Michael P. Wade, 3304 Shakertown Ct., Antioch, Tenn. 37013

Filed Nov. 28, 1994, Ser. No. 31,426

Term of patent 14 years

U.S. Cl. D2—607

366,554

HAND WARMER

Richard L. Lawson, 6405 Morris Rd., Hamilton, Ohio 45011-5128

Filed Jul. 25, 1994, Ser. No. 26,317

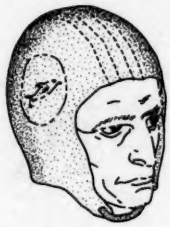
Term of patent 14 years

U.S. Cl. D2—610

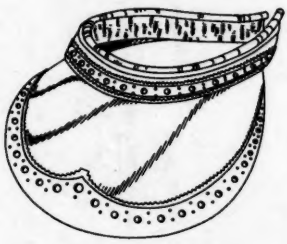
366,555
WEIGHT LIFTING BELT
Jerry Daniels, P.O. Box 587, Ooltewah, Tenn. 37363
Filed May 17, 1994, Ser. No. 23,047
Term of patent 14 years
U.S. Cl. D2—627

366,556
DINING BIB
Florence R. Wilson, 1707 Carol Stream, Richardson, Tex. 75081
Filed Aug. 16, 1994, Ser. No. 27,239
Term of patent 14 years
U.S. Cl. D2—861

366,557
SOFT HAT IN THE SHAPE OF A FOOTBALL HELMET
Theodore Ashby, and Ann Ashby, both of 9 Roome Ave., Pompton Plains, N.J. 07444
Filed Jun. 23, 1994, Ser. No. 24,891
Term of patent 14 years
U.S. Cl. D2—870

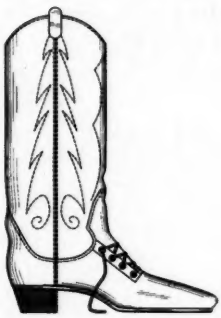


366,558
VISOR
Sheri Galper, 22342 Lavender Bell La., Woodland Hills, Calif. 91367, and Eugene B. Schrier, 24 Dapplegray La., Rolling Hills, Calif. 90274
Filed Aug. 26, 1994, Ser. No. 27,641
Term of patent 14 years
U.S. Cl. D2—872



366,559
BOOT FOR ROLLER-SKATES
Ting-Hsing Chen, Tainan, Taiwan, Prov. of China, assignor to Far Great Plastics Industrial Co., Ltd., Tainan, Taiwan, Prov. of China
Filed Oct. 7, 1994, Ser. No. 29,499
Term of patent 14 years
U.S. Cl. D2—904

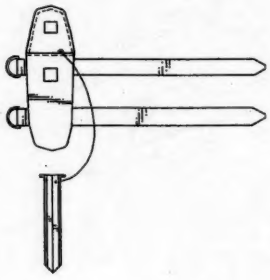
366,560
BOOT WITH LACES
John F. Reedy, P.O. Box 17458, Munds Park, Ariz. 86017, and Kathy M. Yarbrough, 7865 Circle S Dr., Sierra Vista, Ariz. 85635
Filed Dec. 1, 1994, Ser. No. 31,642
Term of patent 14 years
U.S. Cl. D2—912



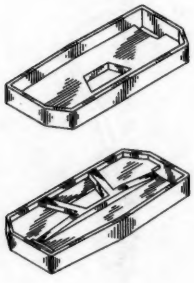
366,561
ELEMENT FOR A SHOE UPPER
Joseph Shea, Boston, Mass., assignor to SRL, Inc., Wilmington, Del.
Filed Sep. 9, 1994, Ser. No. 28,282
Term of patent 14 years
U.S. Cl. D2—972

366,562
SKI EQUIPMENT CARRIER
Jung Sung-Rok, 4th Floor, Daegun Bldg., 822-5, Yoksam-Dong, Kangnam-Ku, Seoul, 135-080, Rep. of Korea
Filed Aug. 1, 1994, Ser. No. 26,530
Term of patent 14 years
U.S. Cl. D3—221

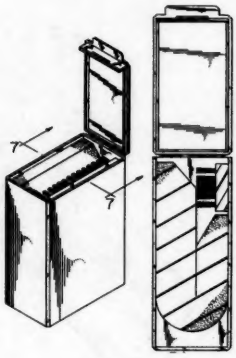
366,563
COMBINED PORTABLE ATTACHABLE ICE PICK AND HOLDER
John W. Mumley, P.O. Box 132, East Alburg, Vt. 05440
Filed Jun. 9, 1994, Ser. No. 24,133
Term of patent 14 years
U.S. Cl. D3—228



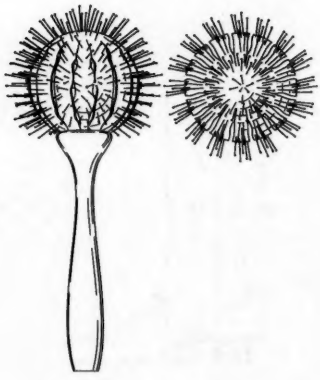
366,564
EYEGLASS CASE
Larry C. Yabarra, 4674 E. Vassar, Fresno, Calif. 93703
Filed Nov. 22, 1994, Ser. No. 31,314
Term of patent 14 years
U.S. Cl. D3—266



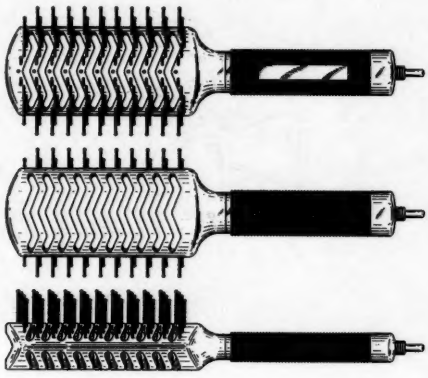
366,565
GOLF CLUB HEAD CLEANER
John Harper, 28 Wingfield Road, Trowbridge Wilts, BA14 9ED, United Kingdom
Filed Dec. 29, 1994, Ser. No. 32,827
Term of patent 14 years
U.S. Cl. D4—121



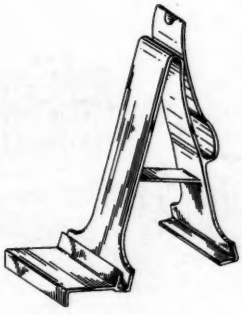
366,566
VENTED HAIRBRUSH
Sabrina S. Denebeim, 260 Avila St., San Francisco, Calif. 94123
Filed Aug. 17, 1994, Ser. No. 27,258
The portion of the term of this patent subsequent to Jan. 2, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—128



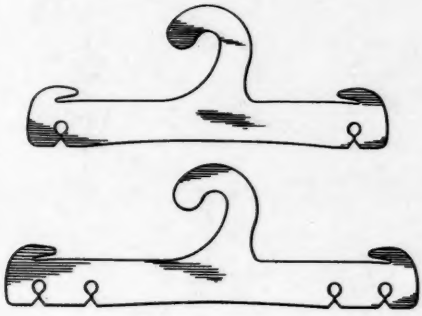
366,567
HAIRBRUSH
Kathy Gertsma, Sausalito, and Christopher Davis, San Francisco, both of Calif., assignors to West Coast Beauty Supply Co., Benicia, Calif.
Filed Mar. 29, 1995, Ser. No. 36,869
Term of patent 14 years
U.S. Cl. D4—136



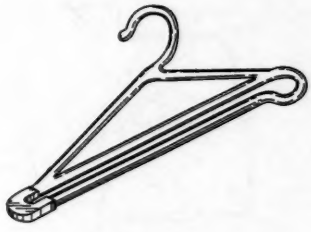
366,568
BOOK HOLDER
Samuel Pagano, 1632 Squaw Creek, Girard, Ohio 44420
Filed Mar. 3, 1995, Ser. No. 35,626
Term of patent 14 years
U.S. Cl. D6—310



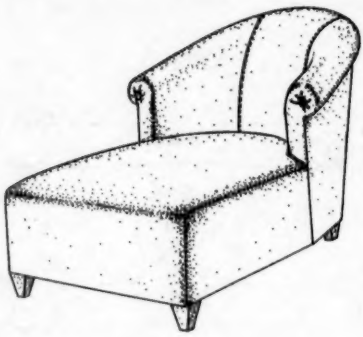
366,569
HANGER
Colin V. Coles, and Joe Magro, both of Melbourne, Australia, assignors to Visy Board Properties Pyt Ltd, Victoria, Australia
Filed Feb. 22, 1994, Ser. No. 19,065
Term of patent 14 years
U.S. Cl. D6—315



366,570
CLOTHES HANGER
Masud Zubery, 4242 Delaney St., Pierre Fonds, Canada
Filed Dec. 22, 1994, Ser. No. 32,665
Term of patent 14 years
U.S. Cl. D6—317



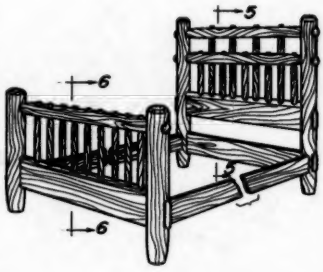
366,571
CHAISE
John Hutton, New York, N.Y., assignor to Donghia Furniture, New York, N.Y.
Filed Sep. 16, 1993, Ser. No. 13,037
Term of patent 14 years
U.S. Cl. D6—361



366,572
CHAIR FRAME
Stephen C. Hess, Birmingham, Ala., assignor to Winston Furniture Company of Alabama, Birmingham, Ala.
Filed Jun. 17, 1994, Ser. No. 24,603
The portion of the term of this patent subsequent to Aug. 22, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—373

366,573
CHAIR
Stephen C. Hess, Birmingham, Ala., assignor to Winston Furniture Co. of Alabama, Birmingham, Ala.
Filed Jun. 22, 1994, Ser. No. 24,885
The portion of the term of this patent subsequent to Nov. 22, 2008, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—373

366,574
BED
Michael J. Paus, High Point, N.C., assignor to Universal Furniture Industries, Inc., High Point, N.C.
Filed Mar. 24, 1994, Ser. No. 20,331
Term of patent 14 years
U.S. Cl. D6—395



366,575

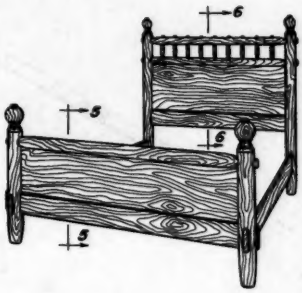
BED

Michael J. Paus, High Point, N.C., assignor to Universal Furniture Industries, Inc., High Point, N.C.

Filed Sep. 25, 1994, Ser. No. 20,411

Term of patent 14 years

U.S. Cl. D6—395



366,576

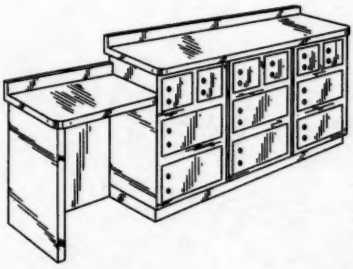
COMBINED LOBBY COUNTER, PARCEL LOCKERS AND HANDICAP TABLE

George F. Stacy, Traverse City, Mich., assignor to HSS Industries, Inc., Traverse City, Mich.

Filed Aug. 15, 1994, Ser. No. 27,194

Term of patent 14 years

U.S. Cl. D6—397



366,577

FULL SIZE FOOTALL LOCKER

Thomas A. Tisbo, Barrington Hills; Stephen P. Whitehead, Elgin, and Lyle A. Rosine, Aurora, all of Ill., assignors to Suncast Corporation, Batavia, Ill.

Filed May 5, 1994, Ser. No. 22,462

Term of patent 14 years

U.S. Cl. D6—434

366,578

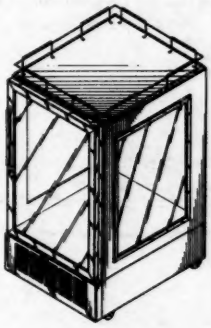
MOBILE BEVERAGE STORAGE CABINET

Duane A. Cormican, Glenwood City, and Douglas J. Klatt, Hudson, both of Wis., assignors to Nor-Lake, Incorporated, Hudson, Wis.

Filed Apr. 1, 1993, Ser. No. 7,929

Term of patent 14 years

U.S. Cl. D6—470



366,579

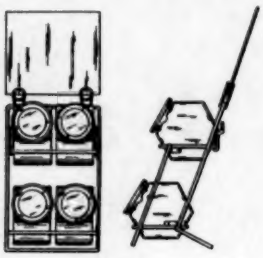
CONTAINER SUPPORTING DISPLAY RACK

Ira M. Kozak, 2475 Woodlawn Dr., Northbrook, Ill. 60062

Filed Aug. 3, 1993, Ser. No. 11,349

Term of patent 14 years

U.S. Cl. D6—476



366,580

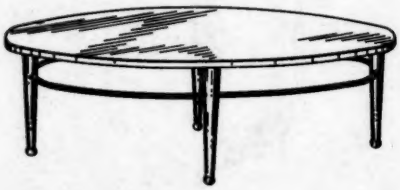
ELLIPTICAL COFFEE TABLE

Richard D. Berry, Jr., and David A. Clark, both of Hickory, N.C., assignors to Ethen Allen Finance Corporation, Danbury, Conn.

Filed Dec. 19, 1994, Ser. No. 32,405

Term of patent 14 years

U.S. Cl. D6—480



366,581

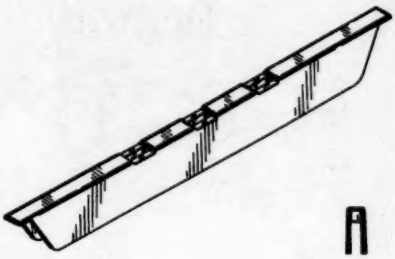
FOOD SERVICE DIVIDER BAR

Argyle Campbell, Newport Beach, and Larry D. Maddux, Westminster, both of Calif., assignors to Cambro Manufacturing Company, Huntington Beach, Calif.

Filed Aug. 22, 1994, Ser. No. 27,397

Term of patent 14 years

U.S. Cl. D6—491



366,582

ARMREST

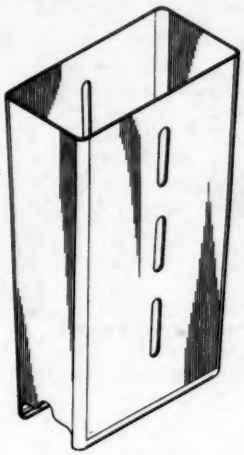
Hans-Joachim Wingerter, Wutoschingen, Germany, assignor to Herman Miller, inc., Zeeland, Mich.

Filed Aug. 3, 1994, Ser. No. 25,223

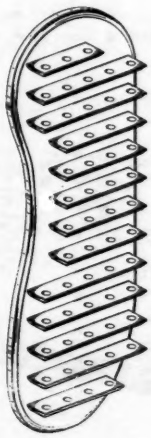
Term of patent 14 years

U.S. Cl. D6—501

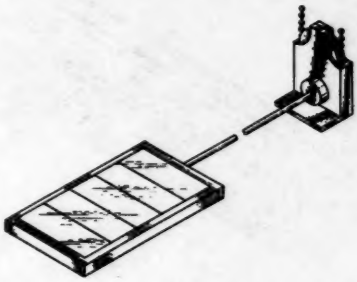
366,583
DISPOSABLE DIAPER DISPENSER
Melvin C. Scalfe, R.R. #1, Box 674, Osceola Mills, Pa. 16666
Filed Feb. 27, 1995, Ser. No. 35,399
Term of patent 14 years
U.S. Cl. D6—515



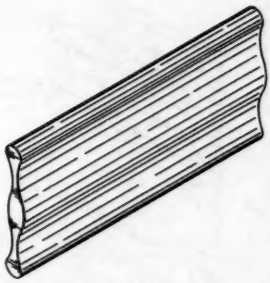
366,584
GOLF BALL DISPLAY RACK
Kevin M. Ellis, 3429 Berkeley Way, Dallas, Ga. 30132
Filed May 2, 1994, Ser. No. 22,167
Term of patent 14 years
U.S. Cl. D6—552



366,585
SOLAR ACTIVATED OPENING AND CLOSING DEVICE FOR USE WITH VERTICAL BLINDS
Melvin M. Mueller, 810 Old Willow Rd. #109, Prospect Heights, Ill. 60070
Filed Jun. 27, 1994, Ser. No. 25,085
Term of patent 14 years
U.S. Cl. D6—580



366,586
LOUVER
Russell H. Underdahl, North Oaks, Minn., assignor to Pinecrest, Inc., Minneapolis, Minn.
Filed Jul. 21, 1994, Ser. No. 26,173
Term of patent 14 years
U.S. Cl. D6—580



366,587

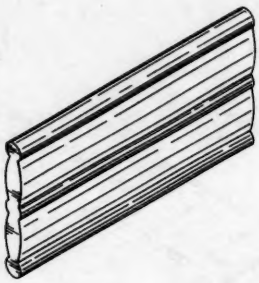
LOUVER

Russell H. Underdahl, North Oaks, Minn., assignor to Pinecrest, Inc., Minneapolis, Minn.

Filed Jul. 21, 1994, Ser. No. 26,174

Term of patent 14 years

U.S. Cl. D6—580



366,588

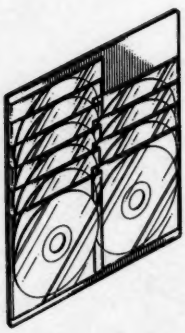
COMPACT DISC DISPLAY BOARD AND HOLDER

Richard A. Gnant, 4839 E. Sunnyside Dr., Scottsdale, Ariz. 85254

Filed Oct. 27, 1994, Ser. No. 30,335

Term of patent 14 years

U.S. Cl. D6—630



366,589

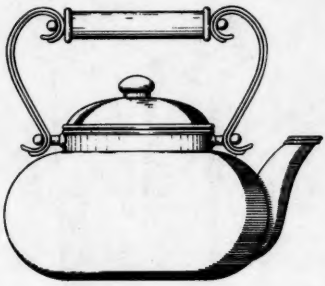
KETTLE

Bruce Ancona, New York, N.Y., assignor to B. Via International Housewares, Inc., Englewood Cliffs, N.J.

Filed Oct. 17, 1994, Ser. No. 29,760

Term of patent 14 years

U.S. Cl. D7—320



366,590

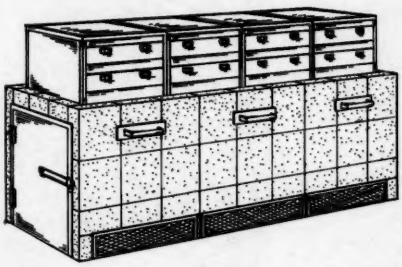
COOK/SMOKER

Lawrence E. Reddick, 3201 Loma Verde Dr., #108, San Jose, Calif. 95117

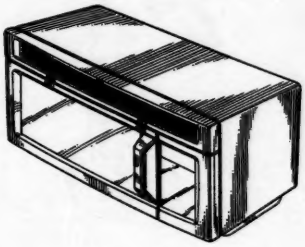
Filed Apr. 17, 1995, Ser. No. 37,715

Term of patent 14 years

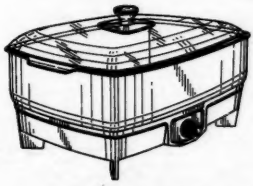
U.S. Cl. D7—348

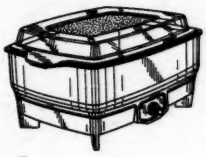


366,591
MICROWAVE OVEN
Byung S. Kim, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea
Filed Aug. 2, 1994, Ser. No. 26,648
Claims priority, application Rep. of Korea, Mar. 24, 1994, 5786/1994
Term of patent 14 years
U.S. Cl. D7—351

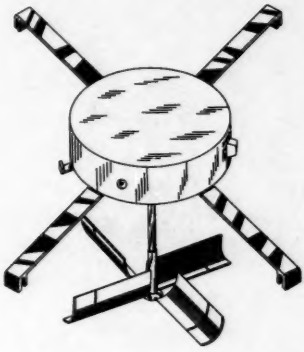


366,592
ELECTRIC COOKER
William C. Cesaroni, Glenview, Ill., and Edward J. Duquaine, Jr., West Bend, Wis., assignors to The West Bend Company, West Bend, Wis.
Filed Apr. 15, 1987, Ser. No. 38,795
The portion of the term of this patent subsequent to Dec. 8, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—360

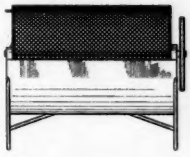


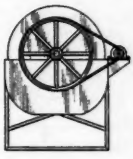


366,593
AUTOMATIC FOOD STIR
Francis L. Robinson, 535 Mohawk Dr., Lancaster, Ohio 43130
Filed Dec. 3, 1993, Ser. No. 15,949
Term of patent 14 years
U.S. Cl. D7—376



366,594
ELECTRIC FISH SCALER
Timothy Ousley, 4704 N. Camp Shohola Dr., Rochester, Ind. 46975
Filed Mar. 10, 1994, Ser. No. 19,708
Term of patent 14 years
U.S. Cl. D7—383





366,595

FOOD PROCESSOR

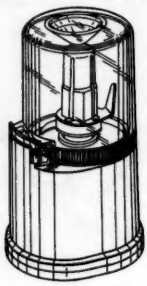
William C. Dobson, West Bend, Wis., and William C. Cesaroni, Glenview, Ill., assignors to The West Bend Company, West Bend, Wis.

Filed May 20, 1987, Ser. No. 53,431

The portion of the term of this patent subsequent to Nov. 8, 2004, has been disclaimed.

Term of patent 14 years

U.S. Cl. D7—384



366,596

MIXING TOOL FOR LIQUIDS

Harvey L. Hewin, 628 Hartford Ave., Huntington Beach, Calif. 92648

Filed Jan. 19, 1993, Ser. No. 3,738

Term of patent 14 years

U.S. Cl. D7—412

366,597

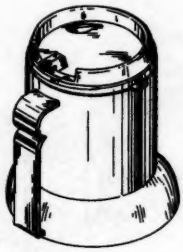
DRINKING MUG

David W. Smith, Fort Collins, and Ted F. Kelley, Jr., Boulder, both of Colo., assignors to Teledyne Industries, Inc., Ft. Collins, Colo.

Filed Oct. 7, 1994, Ser. No. 29,535

Term of patent 14 years

U.S. Cl. D7—536



366,598

TRAY

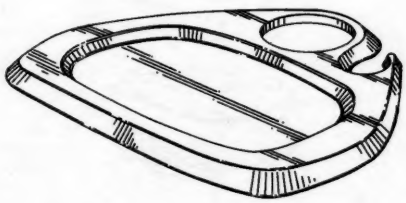
Robert W. Geddes, Fortitiude Valley Qld., Australia, assignor to Nidea Pty. Ltd., Queensland, Australia

Filed Apr. 8, 1994, Ser. No. 21,106

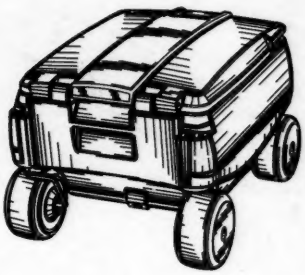
Claims priority, application Australia, Jan. 12, 1993, 3251/93

Term of patent 14 years

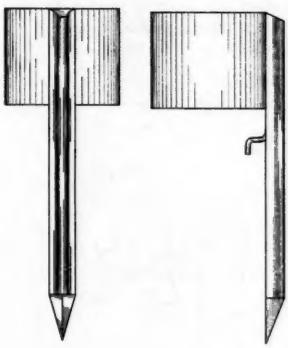
U.S. Cl. D7—553



366,599
WHEELED INSULATED COOLER
Patrick W. Brown, Strongsville, and Craig M. Saunders, Rocky River, both of Ohio, assignors to Rubbermaid Specialty Products Inc., Wooster, Ohio
Filed Dec. 21, 1994, Ser. No. 32,554
Term of patent 14 years
U.S. Cl. D7—605

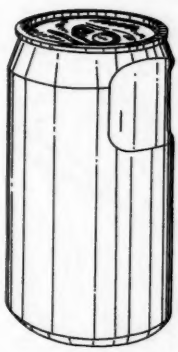


366,600
COMBINED BEVERAGE CONTAINER AND BLANKET/TOWEL SPIKE
Jay S. Laskowski, 2247 Arabian Way, and Karl E. Gneiting, 2244 Arabian Way, both of Corona, Calif. 91719
Filed Jan. 5, 1995, Ser. No. 33,123
Term of patent 14 years
U.S. Cl. D7—620



366,601
BOTTLE HOLDER
Akop Oroudjian, 1135 E. Maple St., Glendale, Calif. 91205
Filed Oct. 24, 1994, Ser. No. 30,184
Term of patent 14 years
U.S. Cl. D7—622

366,602
DRINKING STRAW DISPENSER
Evan R. Penn, Bondi, and Robert D. Barta, Double Bay, both of, Australia, assignors to 3D International Promotions Pty. Ltd., Australia
Filed Jun. 22, 1994, Ser. No. 24,864
Term of patent 14 years
U.S. Cl. D7—636



366,603

HANDLE FOR FORKS, SPOONS, AND TOOTHBRUSHES

Susan Harrison, Wichita Falls, Tex., assignor to Zooth, Inc., Wichita Falls, Tex.

Continuation-in-part of Ser. No. 3,463, Jan. 12, 1993, Pat. No. 5,269,420. This application Oct. 22, 1993, Ser. No. 14,501

Term of patent 14 years

U.S. Cl. D7—654

366,604

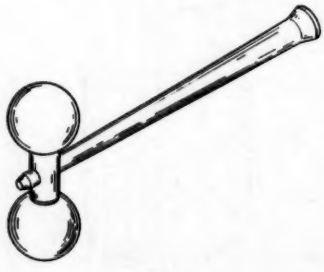
NOVELTY HAMMER

Louis E. Welch, Jr., 1010 Dodd St., River Wood, Nebr. 68883

Filed Nov. 30, 1994, Ser. No. 31,533

Term of patent 14 years

U.S. Cl. D8—77



366,605

HANDLE FOR A KNIFE

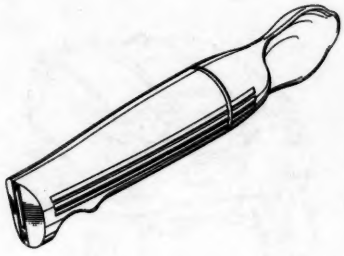
Katsumi Hasegawa, Sagamihara, Japan, assignor to Kai R & D Center Co., Ltd., Seki, Japan

Filed Apr. 29, 1994, Ser. No. 22,185

Claims priority, application Japan, Jan. 29, 1993, 5-32916

Term of patent 14 years

U.S. Cl. D8—107



366,606

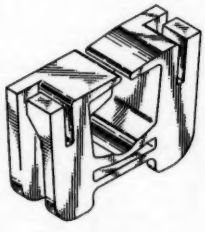
CABLE HOLDER

Toshinobu Nakamura, Tokyo, Japan, assignor to Shinagawa Shoko Co., Ltd., Tokyo, Japan

Filed May 24, 1994, Ser. No. 23,403

Term of patent 14 years

U.S. Cl. D8—356



366,607

TIE DOWN STRAP

Paul Holmgren, Stanchfield, and Michael Bobo, Braham, both of Minn., assignors to JSC Marketing Incorporated, Minneapolis, Minn.

Filed Sep. 17, 1993, Ser. No. 13,070

Term of patent 14 years

U.S. Cl. D8—382

366,608

PLASTIC FASTENER

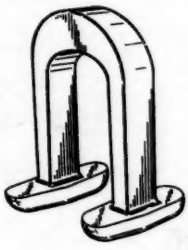
Charles L. Deschenes, North Attleboro; Terence J. Jones, Bolton, both of Mass., and William J. Cooper, Woonsocket, R.I., assignors to Avery Dennison Corporation, Pasadena, Calif.

Filed Sep. 19, 1994, Ser. No. 28,647

The portion of the term of this patent subsequent to Aug. 21, 1995, has been disclaimed.

Term of patent 14 years

U.S. Cl. D8—382



366,609

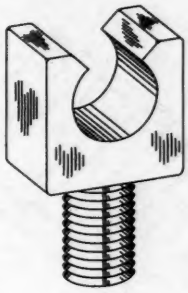
CLAMP FOR PEGBOARD HOOK

James L. McDonald, 260 Tipton Rd., Roseburg, Oreg. 97470

Filed Sep. 9, 1994, Ser. No. 28,214

Term of patent 14 years

U.S. Cl. D8—387



366,610

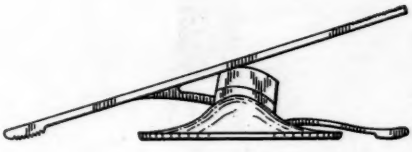
SPRING CLIP

Jon M. Blumenaus, Dalton, Ga., assignor to Clipstix, Inc., Dalton, Ga.

Filed Sep. 14, 1994, Ser. No. 28,388

Term of patent 14 years

U.S. Cl. D8—395



366,611

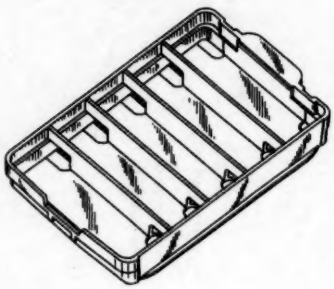
RAZOR BLADE CARTRIDGE DISPENSER

Norman D. Poisson, Andover, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Jul. 20, 1994, Ser. No. 26,146

Term of patent 14 years

U.S. Cl. D9—342



366,612

PACKAGE FOR INSTANT ADHESIVES

Richard C. Edstrom, New York, N.Y.; Bryon J. Bourgeois, St. Albans, Vt., and Richard N. Hirst, Teaneck, N.J., assignors to Loctite Corporation, Hartford, Conn.

Filed Mar. 11, 1994, Ser. No. 19,836

Term of patent 14 years

U.S. Cl. D9—429

366,613

DESSERT CUP

Jerry Fultz, Lancaster, Pa., assignor to BC-USA, Inc., New Holland, Pa.

Filed May 6, 1994, Ser. No. 22,517

Term of patent 14 years

U.S. Cl. D9—429

366,614

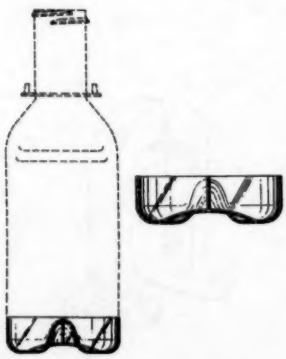
BASE FOR A BOTTLE

Frank E. Semersky, and Daniel J. Durham, both of Toledo, Ohio, assignors to Plastic Technologies, Inc., Holland, Ohio

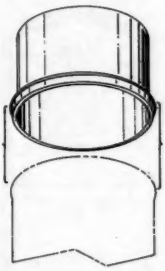
Filed Nov. 15, 1994, Ser. No. 31,019

Term of patent 14 years

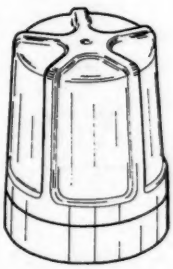
U.S. Cl. D9—434



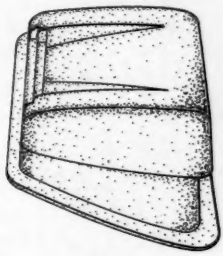
366,615
MIXING SHIELD
Robert A. Gearin, 3090 N. Lexington Ave., St. Paul, Minn. 55113
Continuation-in-part of Ser. No. 1,733, Nov. 23, 1992, abandoned. This application Nov. 21, 1994, Ser. No. 31,271
Term of patent 14 years
U.S. Cl. D9—434



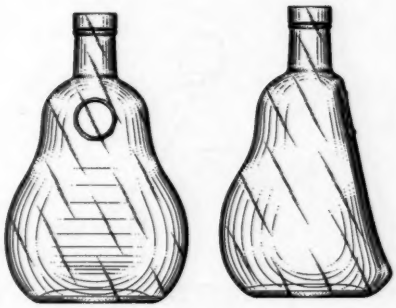
366,616
PROTECTIVE CAP FOR FINGER PUMP
Michael G. Knickerbocker, Crystal Lake, Ill., assignor to Aptar Group, Inc., Cary, Ill.
Filed Nov. 3, 1994, Ser. No. 30,614
Term of patent 14 years
U.S. Cl. D9—445



366,617
CONTAINER SPOUT
Jean-Marie Hotz, Prèles, Switzerland, assignor to Tetra Alfa Holdings S.A., Pully, Switzerland
Continuation-in-part of Ser. No. 32,409, Dec. 19, 1994, abandoned, which is a continuation of Ser. No. 918,228, Jul. 24, 1992, abandoned. This application Feb. 17, 1995, Ser. No. 35,401
Claims priority, application Switzerland, Jan. 24, 1992, 119 528
Term of patent 14 years
U.S. Cl. D9—447



366,618
BOTTLE
Isabelle Brillet, and Jean-Louis Brillet, both of Chateauneuf, France, assignors to Maison J.R. Brillet S.A., Chateauneuf, France
Filed Apr. 5, 1995, Ser. No. 37,163
Claims priority, application France, Nov. 10, 1994, 94 6240
Term of patent 14 years
U.S. Cl. D9—522



366,619
BOTTLE
Don Holbrook, 7673 S. Caballero Dr., Sandy, Utah 84093
Filed Jan. 24, 1995, Ser. No. 33,933
Term of patent 14 years
U.S. Cl. D9—526

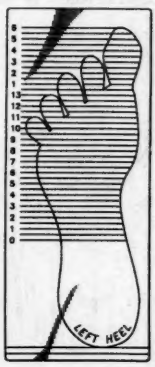
366,620
COMBINED BOTTLE AND CAP
Gene J. Kuzma, Columbus, and Douglas W. Weaver, Troy, both of Ohio, assignors to G K Packaging, Inc., Columbus, Ohio
Filed Jun. 28, 1994, Ser. No. 25,319
Term of patent 14 years
U.S. Cl. D9—542

366,621
TRAVEL CLOCK
Cheng F. W. George, Shiu Fai Terrace, and Yu P. Hop, Kwai Chung, both of, Hong Kong, assignors to Tomor Electronics Ltd., Quarry Bay, Hong Kong
Filed Jan. 24, 1995, Ser. No. 33,953
Term of patent 14 years
U.S. Cl. D10—15

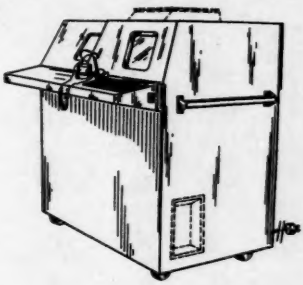
366,622
HANDS-FREE JIGGER
William A. Cary, 1041 Washington Ave., Box 18, Miami Beach, Fla. 33139
Division of Ser. No. 6,067, Mar. 23, 1993, Pat. No. Des. 350,904. This application Aug. 8, 1994, Ser. No. 24,721
Term of patent 14 years
U.S. Cl. D10—46.2

366,623
PLOTTER HOUSING
Patrick Nguyen, 759 S. Leland Dr., Diamond Bar, Calif. 91765
Filed May 16, 1995, Ser. No. 38,817
Term of patent 14 years
U.S. Cl. D10—63

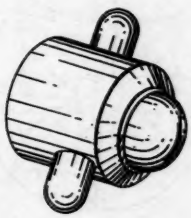
366,624
RIGHT AND LEFT FOOT SHOE SIZER
Kyle R. Collins, 1440 Longfellow, Detroit, Mich. 48206
Filed Nov. 21, 1994, Ser. No. 31,279
Term of patent 14 years
U.S. Cl. D10—70



366,625
OIL ANALYSIS APPARATUS
Charles E. Carroll, Kingston, N.H., assignor to Thermo Jarrell Ash Corporation, Franklin, Mass.
Division of Ser. No. 191,395, Feb. 2, 1994. This application Jan. 5, 1995, Ser. No. 33,141
Term of patent 14 years
U.S. Cl. D10—81



366,626
WATCH CROWN/STEM
Francoise H. Droz, Rue Haute 36, CH 1422, Grandson, Switzerland
Filed May 25, 1994, Ser. No. 23,423
Term of patent 14 years
U.S. Cl. D10—131



366,627

WATCH BRACELET

Burgener Eddy, Le Landeron, Switzerland, assignor to Severin Montres AG (Severin Montres SA) (Severin Montres Ltd), Lengnau, Switzerland

Filed Oct. 25, 1994, Ser. No. 30,268

Claims priority, application Hague Agreement, Apr. 26, 1994, DMA/002501

Term of patent 14 years

U.S. Cl. D11—17

366,628

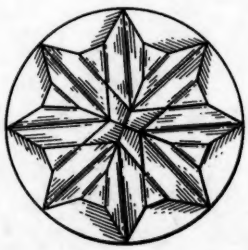
DIAMOND

Henry Grossbard, Belle Harbor, N.Y., assignor to Park Satienrapat, Bangrak THX

Filed Nov. 14, 1994, Ser. No. 30,949

Term of patent 14 years

U.S. Cl. D11—90



366,629

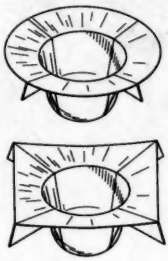
FLOWER POT COVER

Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 781,453, Oct. 21, 1991, Pat. No. Des. 348,634, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, Ser. No. 411,249, Sep. 22, 1984, Pat. No. Des. 358,113, Ser. No. 411,247, Sep. 22, 1989, and Ser. No. 411,245, Sep. 22, 1989. This application Oct. 20, 1992, Ser. No. 693

Term of patent 14 years

U.S. Cl. D11—164



366,630

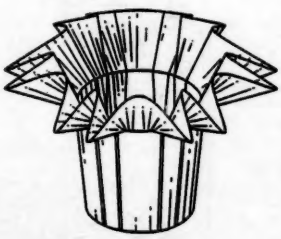
FLOWER POT COVER

Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 807,684, Dec. 16, 1991, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, said Ser. No. 710,272is a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, Ser. No. 411,247, Sep. 22, 1989, and Ser. No. 411,245, Sep. 22, 1989. This application Jan. 8, 1993, Ser. No. 3,581

Term of patent 14 years

U.S. Cl. D11—164



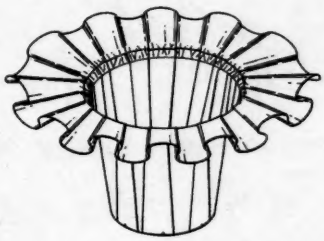
366,631

FLOWER POT COVER

Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill. Continuation of Ser. No. 543,628, Jun. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 411,247, Sep. 22, 1989, which is a continuation of Ser. No. 283,014, Dec. 8, 1988, abandoned, which is a continuation of Ser. No. 652,903, Sep. 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 613,053, May 22, 1984, Pat. No. Des. 293,224. This application Jul. 21, 1994, Ser. No. 26,208

Term of patent 14 years

U.S. Cl. D11—164



366,632

FLOWER STEM HOLDER FOR FLOWER VASE

Daniel W. Gaumer, 208 Daniel Boone Rd., Birdsboro, Pa. 19508

Filed Dec. 6, 1994, Ser. No. 32,102

Term of patent 14 years

U.S. Cl. D11—164

366,633

CHILD'S SLED

Mario A. Pasin, Hinsdale, Ill., and James B. Easley, Minneapolis, Minn., assignors to Radio Flyer Inc., Chicago, Ill.

Filed Sep. 22, 1994, Ser. No. 28,801

Term of patent 14 years

U.S. Cl. D12—6

366,634

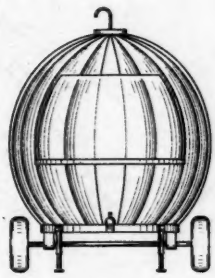
LEMONADE STAND

John R. Anderson, 15438 Oasis Rd., Caldwell, Id. 83605

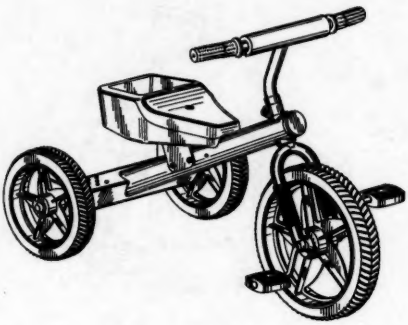
Filed Jul. 11, 1994, Ser. No. 25,716

Term of patent 14 years

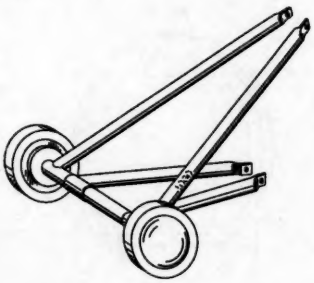
U.S. Cl. D12—102



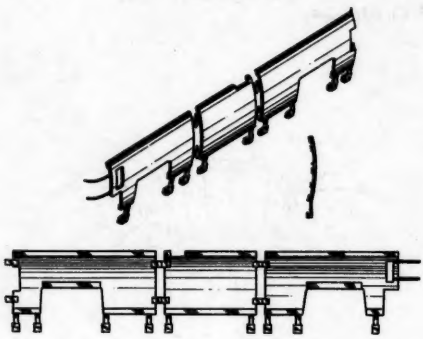
366,635
CHILD'S TRICYCLE
Mark Pasin, Oak Park, Ill., and James B. Easley, Minneapolis, Minn., assignors to Radio Flyer Inc., Chicago, Ill.
Filed Sep. 22, 1994, Ser. No. 28,802
Term of patent 14 years
U.S. Cl. D12—112



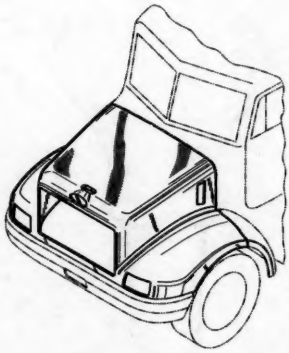
366,636
BICYCLE SAFETY UNIT FOR STUNT WHEELIES
Raymond Smith, 26 Becker Ter., Irvington, N.J. 07111
Filed Jun. 17, 1994, Ser. No. 24,617
Term of patent 14 years
U.S. Cl. D12—114



366,637
VEHICLE BODY PROTECTIVE PANEL UNIT
Russell Bushey, 742 2nd Ave., Space 24, P.O. Box 69, Gold Hill, Oreg. 97545
Filed Aug. 31, 1994, Ser. No. 27,777
Term of patent 14 years
U.S. Cl. D12—167



366,638
TRUCK HOOD
Eric N. Tucker, Denton, Tex., and Ronaldo S. Natividad, San Jose, Calif., assignors to PACCAR Inc.
Filed Sep. 16, 1994, Ser. No. 28,501
Term of patent 14 years
U.S. Cl. D12—173



366,639

VEHICLE DUST DEFLECTOR

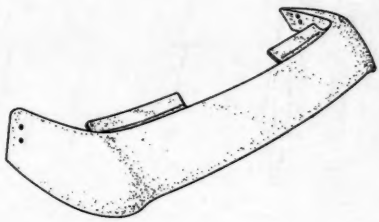
Rodney E. Horwill, P.O. Box 171, Salisbury, Queensland 4107, Australia

Filed Mar. 8, 1994, Ser. No. 19,643

Claims priority, application Australia, Sep. 14, 1993, 2850/93

Term of patent 14 years

U.S. Cl. D12—181



366,640

TRUCK QUARTER FENDER

Eric N. Tucker, Denton, Tex., and Ronaldo S. Natividad, San Jose, Calif., assignors to Paccar Inc, Bellevue, Wash.

Filed Sep. 16, 1994, Ser. No. 28,503

Term of patent 14 years

U.S. Cl. D12—184

366,641

VEHICLE WHEEL

Mark D. Neeper, Denver, Colo., assignor to Mobile Hi-Tech Wheels, Torrance, Calif.

Filed Oct. 31, 1994, Ser. No. 30,462

Term of patent 14 years

U.S. Cl. D12—209

366,642

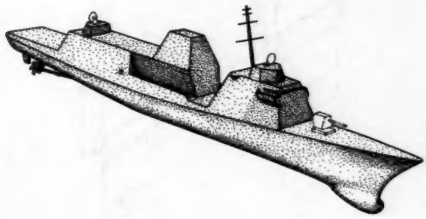
MULTI PURPOSE FRIGATE

James P. Brooks; Ross L. Buck, both of Gautier; John P. Hackett, Ocean Springs; Kenneth E. Hoffman, Gautier; Kermit B. Pethtel, Jr., Ocean Springs; John F. Robbins, Gulfport; William J. Steelman; Martin F. Fitzgerald, both of Ocean Springs, and Thomas J. Thawley, Pascagoula, all of Miss., assignors to Ingalls Shipbuilding Inc., Pascagoula, Miss.

Filed Jul. 28, 1994, Ser. No. 26,445

Term of patent 14 years

U.S. Cl. D12—315



366,643

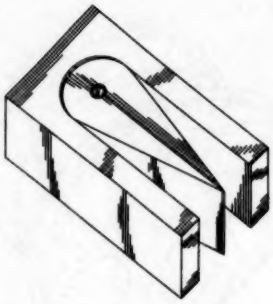
WATER CRAFT PROPULSION DEVICE WITH PIVOTING VANE

Lester E. Ballentine, 9525 Yale Rd., Deerfield, Ohio 44411

Filed Sep. 1, 1994, Ser. No. 27,789

Term of patent 14 years

U.S. Cl. D12—317



366,644

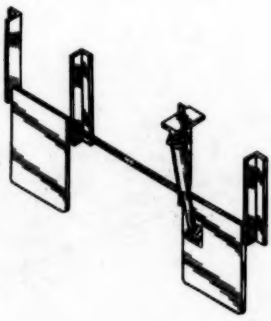
BOAT SPEED REGULATOR

Lyle S. Morrow, 1014 Alpine Rd., Montrose, Colo. 81401-4606

Filed Jan. 11, 1995, Ser. No. 33,743

Term of patent 14 years

U.S. Cl. D12—317



366,645

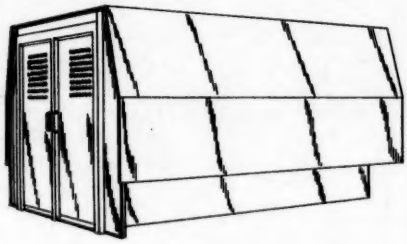
PRISONER TRANSPORT MODULE

Ronald L. Dirck, P.O. Box 196, Warsaw, Ind. 46580

Filed Oct. 15, 1990, Ser. No. 597,585

Term of patent 14 years

U.S. Cl. D12—405



366,646

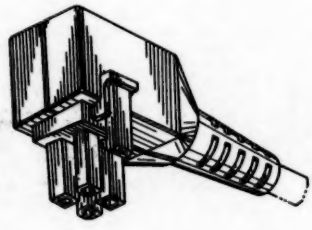
ELECTRICAL CONNECTOR

Francis L. Carr, Downers Grove, Ill., assignor to SAFCO Corporation

Filed Feb. 10, 1995, Ser. No. 34,719

Term of patent 14 years

U.S. Cl. D13—146



366,647

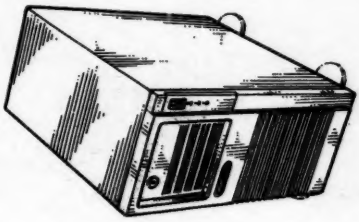
DATA PROCESSING EQUIPMENT UNIT

Randall W. Martin, The Woodlands, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Division of Ser. No. 951,550, Sep. 24, 1992. This application Jan. 31, 1994, Ser. No. 18,150

Term of patent 14 years

U.S. Cl. D14—100



366,648

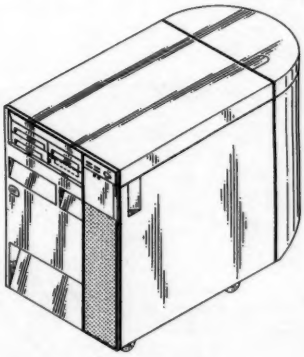
DATA PROCESSING SYSTEM

David W. Hill, and Tim K. Murphy, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 3, 1994, Ser. No. 22,254

Term of patent 14 years

U.S. Cl. D14—100



366,649

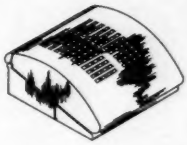
DESKTOP COMPUTER HOUSING

Paul L. Soderburg, 66 Barranca #3, Santa Barbara, Calif. 93109

Filed Feb. 9, 1994, Ser. No. 18,725

Term of patent 14 years

U.S. Cl. D14—106



366,650

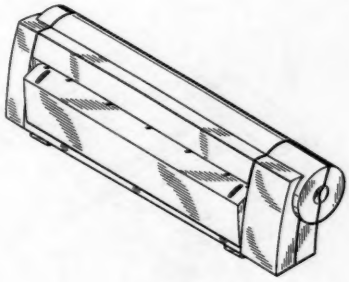
DOCUMENT SCANNER

Raymond J. McKinnon, Jr., Castro Valley, and Michael R. Barry, Palo Alto, both of Calif., assignors to Visioneer Communications, Inc., Palo Alto, Calif.

Filed Oct. 22, 1993, Ser. No. 14,507

Term of patent 14 years

U.S. Cl. D14—114



366,651

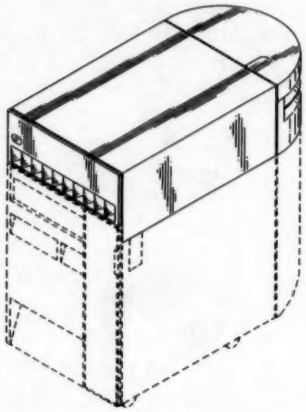
DISK STORAGE EXPANSION UNIT FOR A DATA PROCESSING SYSTEM

David W. Hill, and Tim K. Murphy, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 3, 1994, Ser. No. 22,317

Term of patent 14 years

U.S. Cl. D14—107



366,652

DOCUMENT SCANNER

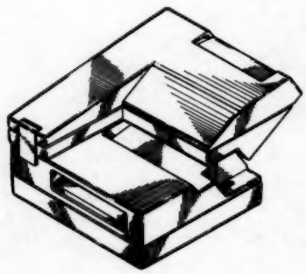
Hayato Ichinose, Yamanashi, Japan, assignor to Nisca Corporation, Yamanashi, Japan

Filed Mar. 6, 1995, Ser. No. 36,601

Claims priority, application Japan, Sep. 6, 1994, 6-26973

Term of patent 14 years

U.S. Cl. D14—107



366,653

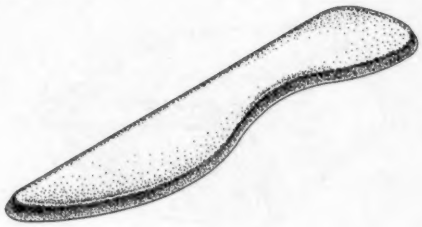
WRISTREST

Ross Lovegrove, London, England, and Stephen Peart, Campbell, Calif., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jul. 26, 1994, Ser. No. 26,355

Term of patent 14 years

U.S. Cl. D14—114



366,654

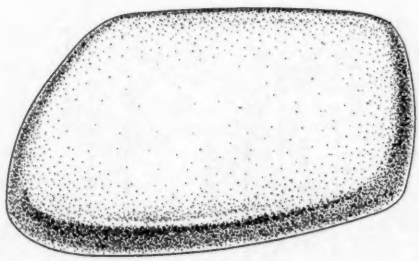
MOUSEPAD

Ross Lovegrove, London, England, and Stephen Peart, Campbell, Calif., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jul. 26, 1994, Ser. No. 26,356

Term of patent 14 years

U.S. Cl. D14—114



366,655

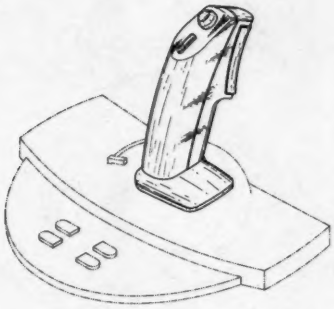
HANDLE FOR A COMPUTER JOYSTICK

Russell Sanchez; Mike Paull; Steve Kaneko, all of Seattle, Wash.; Henry Chin, Portland, Oreg.; Robert Dillon, Venice, Calif.; Michael Knodt, Columbus, Ohio, and Claire Beliard, Seattle, Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Dec. 6, 1994, Ser. No. 31,814

Term of patent 14 years

U.S. Cl. D14—114



366,656

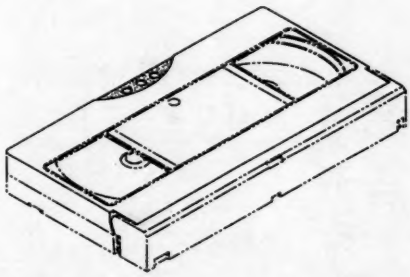
REAR PORTION OF A TOP SURFACE FOR A VIDEOCASSETTE

Gregory H. Johnson, Oakdale, Minn.; Mark J. Ciesko, Hilliard, and Donald J. Staufenberg, Dublin, both of Ohio, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 5, 1994, Ser. No. 20,924

Term of patent 14 years

U.S. Cl. D14—121



366,657

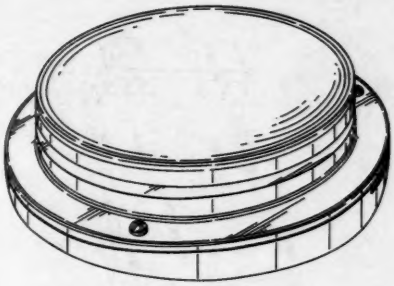
COMMUNICATION AID

Leander Hallgren, St. Paul, and Lisa E. Petersson, Circle Pines, both of Minn., assignors to Ablenet, Inc., Minneapolis, Minn.

Filed Sep. 2, 1994, Ser. No. 28,015

Term of patent 14 years

U.S. Cl. D14—160



366,658

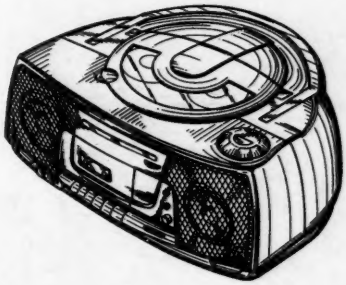
COMBINED DIGITAL AUDIO DISK PLAYER, RADIO AND TAPE RECORDER

Satoshi Fukutome, Hiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 12, 1995, Ser. No. 34,597

Term of patent 14 years

U.S. Cl. D14—168



366,659

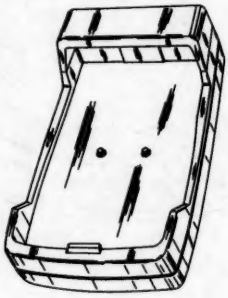
CRADLE MOUNT FOR A PERSONAL COMPUTER FOR USE IN A VEHICLE

Monte Ross, St. Louis, Mo., and Howard Kenig, Southfield, Mich., assignors to Laser Data Technology, Inc., St. Louis, Mo.

Filed Dec. 8, 1993, Ser. No. 16,133

Term of patent 14 years

U.S. Cl. D14—114



366,660

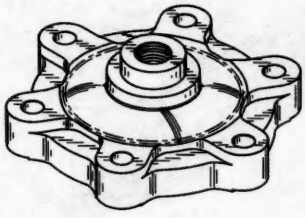
SNOW MOBILE ENGINE HEAD

Steven R. Benson, 5919 S. 350 West, Murray, Utah 84107

Filed Sep. 23, 1994, Ser. No. 28,855

Term of patent 14 years

U.S. Cl. D15—5



366,661

FLANGED FITTING FOR A CATALYTIC CONVERTER

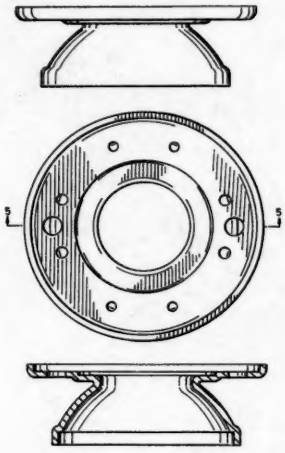
Toshiaki Kanemitsu, Kobe, Japan, assignor to Kabushiki Kaisha Kanemitsu, Akashi, Japan

Filed Oct. 12, 1994, Ser. No. 29,641

Claims priority, application Japan, May 2, 1994, 6-12787; May 2, 1994, 6-12788

Term of patent 14 years

U.S. Cl. D15—5



366,662

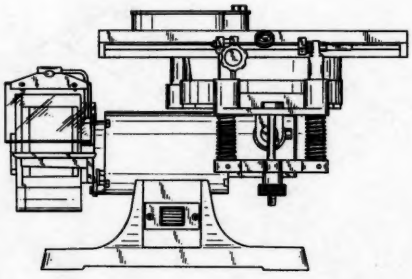
GRINDING AND SHARPENING MACHINE

Jeffrey L. Haffely, Gibsonia; Xun Lei, Cheswick, and Louis C. Brickner, Pittsburgh, all of Pa., assignors to Delta International Machinery Corp., Pittsburgh, Pa.

Filed Aug. 9, 1994, Ser. No. 26,701

Term of patent 14 years

U.S. Cl. D15—124



366,663
LENS COVER FOR CONVERTING EYEGLASSES TO SUNGLASSES
Carlene Metruk, R.R. 1 Box 2910, Underhill, Vt. 05489
Filed Mar. 14, 1994, Ser. No. 19,849
Term of patent 14 years
U.S. Cl. D16—101

366,664

Patent Not Issued For This Number

366,665
CAMERA REMOTE CONTROLLER
Hiroshi Moroboshi, and Tetsuya Yamasaki, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., and Mitsumi Electric Co., Ltd., Japan
Filed Oct. 20, 1993, Ser. No. 14,385
Claims priority, application Japan, Apr. 28, 1993, 5-12482
Term of patent 14 years
U.S. Cl. D16—237

366,666
SUNGLASSES
Gregory F. Arnette, 33965 Cape Cove, South Laguna Beach, Calif. 92677
Filed Aug. 24, 1994, Ser. No. 27,543
Term of patent 14 years
U.S. Cl. D16—325

366,667
SUNGLASSES
Gregory F. Arnette, 33965 Cape Cove, South Laguna Beach, Calif. 92677
Filed Aug. 24, 1994, Ser. No. 27,545
Term of patent 14 years
U.S. Cl. D16—329

366,668

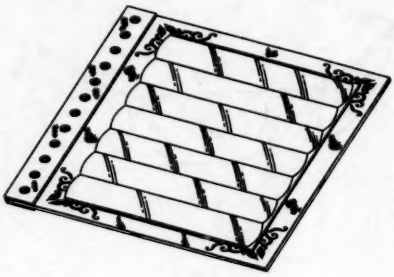
POCKETED PAGE FOR STORING PHOTOGRAPH NEGATIVES

Javier A. Infantas, 251 Galen Dr., Apt. 101-E, Key Biscayne, Fla. 33149

Filed Dec. 5, 1994, Ser. No. 31,767

Term of patent 14 years

U.S. Cl. D19—33



366,669

WRITING INSTRUMENT

James A. McCartney, 301 Sandra La., N. Syracuse, N.Y. 13212, and Tricia A. Jordan, 9510 Woodlawn Dr., Brewerton, N.Y. 13029

Filed May 1, 1995, Ser. No. 38,194

Term of patent 14 years

U.S. Cl. D19—42

366,670

BLACKBOARD ERASER

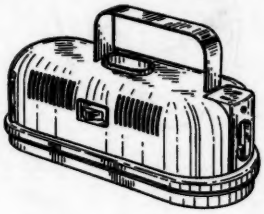
Sung J. Huh, 6/4, 142-4 Kuro-6-dong, Kuro-ku, Seoul, Rep. of Korea

Filed Sep. 9, 1994, Ser. No. 28,229

Claims priority, application Rep. of Korea, Mar. 14, 1994, 4784D94

Term of patent 14 years

U.S. Cl. D19—53



366,671

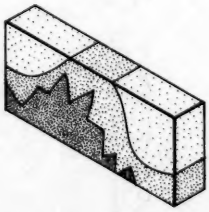
ERASER HAVING A SUNBURST

Sean Kitzmiller, Knoxville, Tenn., assignor to Berol Corporation, Brentwood, Tenn.

Filed Mar. 23, 1995, Ser. No. 36,597

Term of patent 14 years

U.S. Cl. D19—53



366,672

ERASER HAVING A SWIRL

Sean Kitzmiller, Knoxville, Tenn., assignor to Berol Corporation, Brentwood, Tenn.

Filed Mar. 23, 1995, Ser. No. 36,599

Term of patent 14 years

U.S. Cl. D19—53

366,673

EDUCATIONAL TOY FIGURE

Christine J. Harling-Berg, 59 Dunster Rd., Holliston, Mass. 01746

Filed Oct. 17, 1994, Ser. No. 29,754

Term of patent 14 years

U.S. Cl. D19—59

366,674

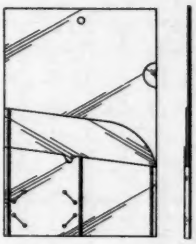
DOCUMENT HOLDER

Masafumi Hirai, Torrance, Calif., assignor to Lion Office Products, Inc., Gardena, Calif.

Filed Oct. 24, 1994, Ser. No. 30,099

Term of patent 14 years

U.S. Cl. D19—86



366,675

DISPLAY STAND

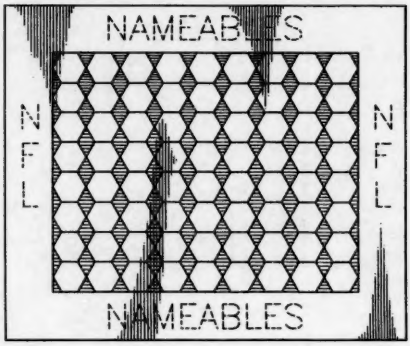
Ray M. Milojevich, 11541 SE. Flavel St., Portland, Oreg. 97266

Division of Ser. No. 4,731, Feb. 12, 1993, Pat. No. Des. 357,705. This application Mar. 7, 1995, Ser. No. 36,013

Term of patent 14 years

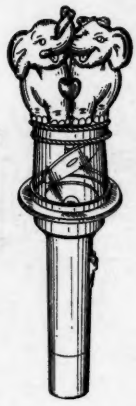
U.S. Cl. D19—90

366,676
BOARD GAME
Roger W. Walker, 6329 S. 30th West Ave., Tulsa, Okla. 74132
Filed Aug. 31, 1994, Ser. No. 27,765
Term of patent 14 years
U.S. Cl. D21—34

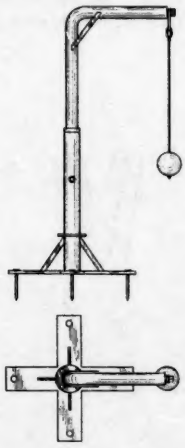


366,677
DINOSAUR-ROCKER
Ken E. Patterson, P.O. Box 1409, Eagle Point, Oreg. 97524
Filed Apr. 13, 1994, Ser. No. 21,237
Term of patent 14 years
U.S. Cl. D21—66

366,678
TOY FLASHLIGHT
Benjamin J. Cimock, Altamonte Springs, Fla., assignor to I & K Trading, Vienna, Va.
Filed Apr. 6, 1994, Ser. No. 20,980
Term of patent 14 years
U.S. Cl. D21—120



366,679
TETHERED BALL HITTING PRACTICE AID
Don A. Clements, 5205 Prince Charles Ct., Arlington, Tex. 76017
Filed Sep. 2, 1994, Ser. No. 28,011
Term of patent 14 years
U.S. Cl. D21—199



366,680

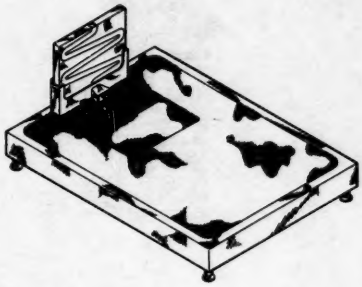
AUTOMATIC GOLF BALL TEEING PLATFORM

James G. Jantz, Box 132 403 West Cortez; James C. Hayden, 102 Tovar P.O. Box 248, and Max A. Jantz, Rte. 2, Box 69, all of Montezuma, Kans. 67867

Filed Sep. 26, 1994, Ser. No. 28,917

Term of patent 14 years

U.S. Cl. D21—208



366,681

TENNIS RACKET

Joseph J. Hodges, 2 Hull St., Oceanside, N.Y. 11572

Filed Jun. 9, 1994, Ser. No. 24,134

Term of patent 14 years

U.S. Cl. D21—212

366,682

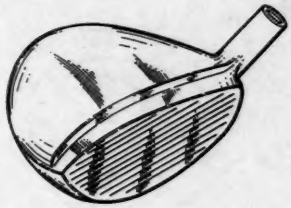
METAL WOOD GOLF CLUB HEAD

Anthony J. Antonious, 7738 Calle Facil, Sarasota, Fla. 34238

Filed Aug. 26, 1994, Ser. No. 27,562

Term of patent 14 years

U.S. Cl. D21—214



366,683

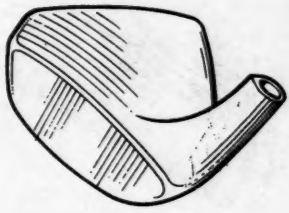
GOLF CLUB HEAD

Donald C. Wood, Carlsbad, Calif., assignor to Plop Golf Company, Carlsbad, Calif.

Filed Sep. 27, 1994, Ser. No. 29,020

Term of patent 14 years

U.S. Cl. D21—214



366,684

GOLF CLUB HEAD

Shih-An Lin, Ping-Tung, Taiwan, Prov. of China, assignor to ROCS Precision Casting Co., Ltd., Ping-Tung, Taiwan, Prov. of China

Filed Dec. 16, 1994, Ser. No. 32,355

Term of patent 14 years

U.S. Cl. D21—214

366,685

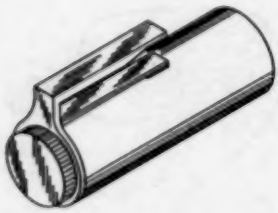
PORTABLE GOLF BALL WASHER

Charles A. Faulk, 1625 S. 109th St., Omaha, Nebr. 68144, and Robert M. Faulk, 9925 Devonshire Dr., Omaha, Nebr. 68114

Filed Dec. 28, 1994, Ser. No. 32,786

Term of patent 14 years

U.S. Cl. D21—234



366,686

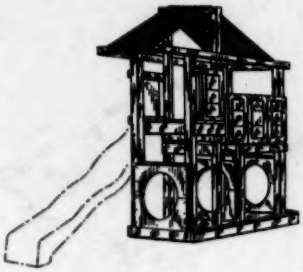
CHILDREN'S PLAY TOWER

William H. Ziegler, Jr., Bedford, Pa., assignor to Hedstrom Corporation, Bedford, Pa.

Filed Aug. 29, 1994, Ser. No. 27,698

Term of patent 14 years

U.S. Cl. D21—244



366,687

SWING SEATING PLATFORM

Robert J. Nolan, Columbus, Miss., and Paul C. Gilles, Bedford, Pa., assignors to Hedstrom Corporation, Bedford, Pa.

Filed Aug. 29, 1994, Ser. No. 27,726

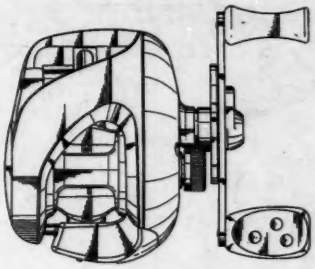
Term of patent 14 years

U.S. Cl. D21—246

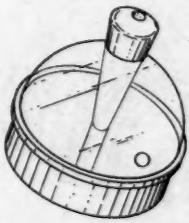
366,688
INSECT TRAP
Kenneth S. Carvalho, 3126A Catherine, Honolulu, Hi. 96836
Filed Jan. 10, 1994, Ser. No. 17,311
Term of patent 14 years
U.S. Cl. D22—122

366,689
INSECT BAIT STATION
Joseph T. Mares, and Allan S. Las, both of Valdosta, Ga., assignors to Griffin Corporation, Valdosta, Ga.
Filed Apr. 21, 1994, Ser. No. 21,619
Term of patent 14 years
U.S. Cl. D22—122

366,690
FISHING REEL
Achim Storz, Zell Am See, Austria, assignor to ABU AB, Svangsta, Sweden
Filed Nov. 7, 1994, Ser. No. 31,191
Term of patent 14 years
U.S. Cl. D22—140



366,691
FISHING FLOAT
L. T. Botkins, 2910 Oak Dr., Paragould, Ark. 72450
Filed Sep. 30, 1993, Ser. No. 13,729
Term of patent 14 years
U.S. Cl. D22—146



366,692

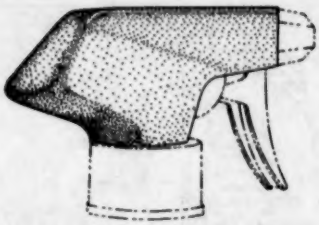
SPRAYER SHROUD

Ronald Wadsworth, Cambria, Calif., assignor to Calmar Inc., City of Industry, Calif.

Filed Sep. 21, 1994, Ser. No. 28,580

Term of patent 14 years

U.S. Cl. D23—213



366,693

BALL VALVE

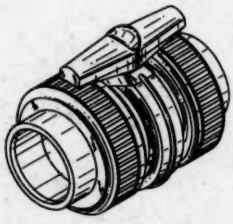
Naef Gregor, Baden-Dattwil, Switzerland, assignor to Georg Fischer Rohrleitungssysteme AG, Schaffhausen, Switzerland

Filed Apr. 18, 1994, Ser. No. 21,437

Claims priority, application Hague Agreement, Jan. 18, 1993, DM/027612

Term of patent 14 years

U.S. Cl. D23—245



366,694

FAUCET HANDLE

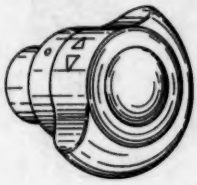
Hans Lobermeier, Menden, Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Germany

Filed Mar. 28, 1995, Ser. No. 36,805

Claims priority, application Germany, Jan. 31, 1994, 94 08 475.0

Term of patent 14 years

U.S. Cl. D23—250



366,695

COMBINED AIR PURIFIER AND CLEANER

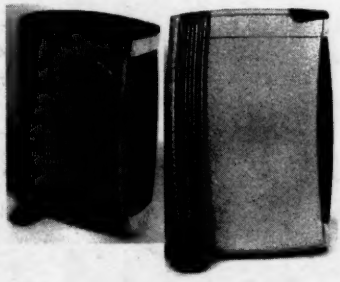
Guillen Berazaluce, Barcelona, Spain, assignor to Moulinex Societe Anonyme, Bagnolet, France

Filed Jan. 13, 1994, Ser. No. 17,558

Claims priority, application France, Jul. 21, 1993, 933,852

Term of patent 14 years

U.S. Cl. D23—364



366,696

EAR PLUG

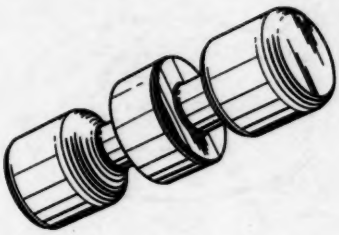
Ward B. Krause, 10518 Ni River Dr., Spotsylvania, Va. 22553

Filed Jul. 21, 1994, Ser. No. 26,204

The portion of the term of this patent subsequent to Nov. 21, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D24—106



366,697

COMBINED MOLDED CONE STYLE FACE MASK AND VISOR

Michael A. Drummond, Bedford, Tex., assignor to Tecnol Medical Products, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 45,524, Apr. 8, 1993, abandoned. This application Oct. 4, 1993, Ser. No. 13,892

Term of patent 14 years

U.S. Cl. D24—110.2

366,698

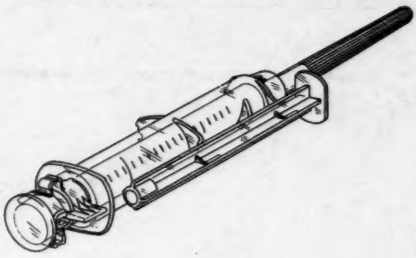
COMBINED PRE-FILLED CARTRIDGE-NEEDLE UNIT AND HOLDER

Mark A. Stiehl, Rochester; William A. Bergstresser, Prattsburgh, both of N.Y.; John J. Niedospial, Princeton Junction, N.J.; Raymond P. Chapman, Fairport, N.Y.; Berle A. Dale, Rochester, N.Y.; Richard J. Felts, Penfield, N.Y., and Douglas W. Pfaff, LeRoy, N.Y., assignors to Sterling Winthrop, Inc., New York, N.Y.

Filed Sep. 29, 1993, Ser. No. 13,667

Term of patent 14 years

U.S. Cl. D24—114



366,699

THORACOSCOPIC FORRESTER RING FORCEPS

Kenneth R. Blake, Brooklyn Park, Minn., assignor to Scanlan International, St. Paul, Minn.

Filed Apr. 22, 1994, Ser. No. 21,741

The portion of the term of this patent subsequent to Jan. 2, 2010, has been disclaimed.

Term of patent 14 years

U.S. Cl. D24—143

366,700

THORACOSCOPIC DEBAKEY CLAMP

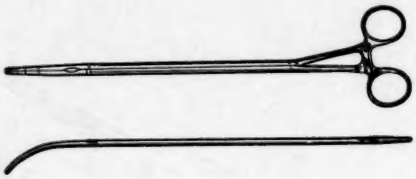
Kenneth R. Blake, Brooklyn Park, Minn. 55444, assignor to Scanlan International, St. Paul, Minn.

Filed Apr. 22, 1994, Ser. No. 21,763

The portion of the term of this patent subsequent to Jan. 2, 2010, has been disclaimed.

Term of patent 14 years

U.S. Cl. D24—143



366,701

MEDICAL IMAGING MACHINE

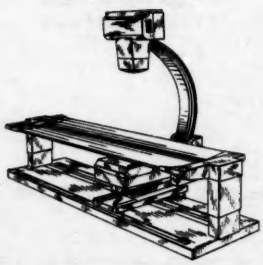
Richard B. Mazess; Larry Fenske, both of Madison, Wis.; Bernard W. Siczek; Aidona A. Siczek, both of Boulder, Colo.; James G. Deluhery, Madison, and Mike M. Tesic, Verona, both of Wis., assignors to Lunar Corporation, Madison, Wis.

Continuation of Ser. No. 15,251, Nov. 12, 1993, abandoned.

This application Nov. 18, 1994, Ser. No. 32,012

Term of patent 14 years

U.S. Cl. D24—159



366,702

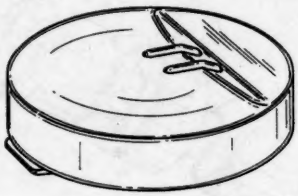
IONTOPHORETIC DRUG DELIVERY CONTROLLER

Karl D. Kirk, III, New York, N.Y., and James R. Toleman, Palo Alto, Calif., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Aug. 30, 1993, Ser. No. 12,391

Term of patent 14 years

U.S. Cl. D24—189



366,703

COMBINED MASSAGER WITH INTERCHANGEABLE MASSAGING HEADS AND CHARGER

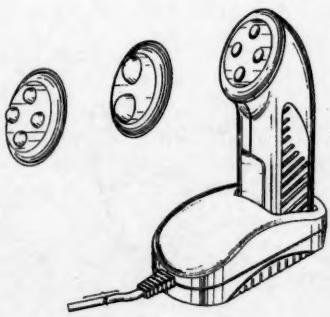
Hing-Wah Huen, Kowloon, Hong Kong, assignor to Fairform Mfg. Co. Ltd., Hong Kong

Filed Dec. 29, 1993, Ser. No. 16,893

Claims priority, application United Kingdom, Nov. 16, 1993, 2035208

Term of patent 14 years

U.S. Cl. D24—214



366,704

TEXTURED PAVING STONE

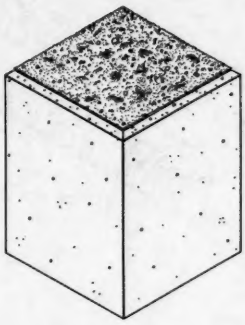
Edward Bryant, Etobicoke, Canada, assignor to Hedgestone Holdings, Inc., Ontario, Canada

Continuation of Ser. No. 591,868, Oct. 2, 1990, abandoned.

This application May 12, 1993, Ser. No. 8,273

Term of patent 14 years

U.S. Cl. D25—113



366,705

LAMP BULB

Chi W. Yang, G/F., 21-23 Po On Road, Sham Shui Po, Kowloon, Hong Kong

Filed Feb. 19, 1992, Ser. No. 838,468

Term of patent 14 years

U.S. Cl. D26—3

366,706

LAMP BULB

Chi W. Yang, G/F., 21-23 Po On Road, Sham Shui Po, Kowloon, Hong Kong

Filed Feb. 19, 1992, Ser. No. 838,469

Term of patent 14 years

U.S. Cl. D26—3

366,707

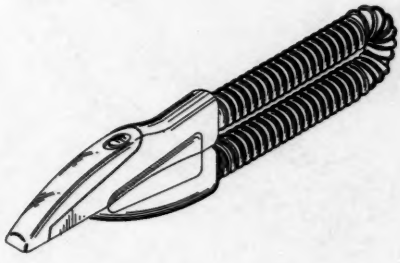
FLEXIBLE FLASHLIGHT

David W. Kaiser, North Haven, Conn., assignor to Black & Decker Inc., Newark, Del.

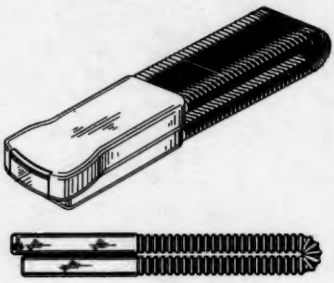
Filed Feb. 21, 1995, Ser. No. 35,076

Term of patent 14 years

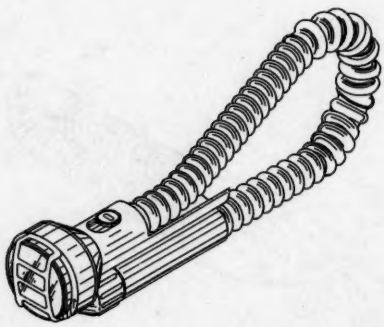
U.S. Cl. D26—43



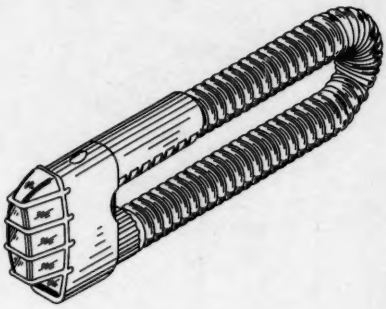
366,708
FLASHLIGHT WITH FLEXIBLE BODY
Paul S. Santarsiero, Avon, Conn., assignor to Black & Decker Inc., Newark, Del.
Filed Mar. 3, 1995, Ser. No. 35,656
Term of patent 14 years
U.S. Cl. D26—43



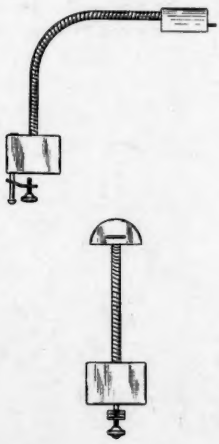
366,709
FLASHLIGHT WITH FLEXIBLE BODY
Aaron Szmanski, Bristol, Conn., assignor to Black & Decker Inc., Newark, Del.
Filed Mar. 13, 1995, Ser. No. 36,058
Term of patent 14 years
U.S. Cl. D26—43



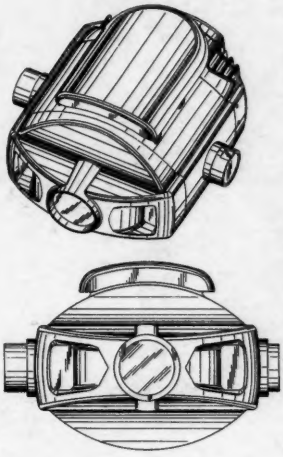
366,710
FLEXIBLE FLASHLIGHT
Aaron Szymanski, Bristol, Conn., assignor to Black & Decker Inc., Newark, Del.
Filed Mar. 13, 1995, Ser. No. 36,060
Term of patent 14 years
U.S. Cl. D26—43



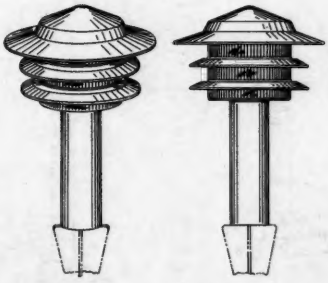
366,711
CLAMP-ON ADJUSTABLE LIGHT FOR A GRILL
Brad L. Clasby, 3604 Stonebrook Farms Ct., Greensboro, N.C. 27406
Filed Nov. 10, 1994, Ser. No. 30,885
Term of patent 14 years
U.S. Cl. D26—60



366,712
ADJUSTABLE SPOT LUMINAIRE
Douglas A. Hanson, Arlington; Timothy D. Stacy, Plano, and Timothy W. Terleski, Garland, all of Tex., assignors to Vari-Lite, Inc., Dallas, Tex.
Filed Mar. 29, 1994, Ser. No. 20,618
Term of patent 14 years
U.S. Cl. D26—63

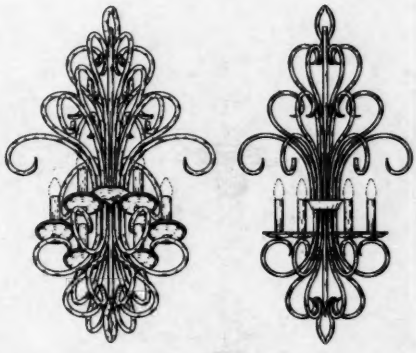


366,713
OUTDOOR LIGHT FIXTURE
Edward C. Cornell, Waukegan, Ill., and Robert D. Giese, Kenosha, Wis., assignors to Intermatic Incorporated, Spring Grove, Ill.
Filed Jul. 27, 1994, Ser. No. 26,434
Term of patent 14 years
U.S. Cl. D26—68

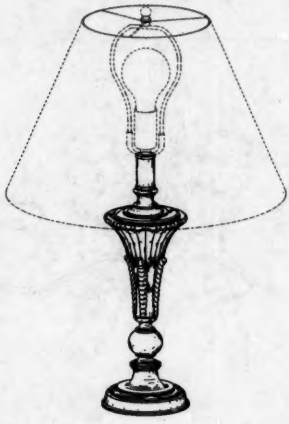


366,714
CHANDELIER
David H. Porter, Chagrin Falls, Ohio, assignor to The L. D. Kichler Co., Cleveland, Ohio
Filed Jan. 5, 1995, Ser. No. 33,101
Term of patent 14 years
U.S. Cl. D26—81

366,715
CHANDELIER
David H. Porter, Chagrin Falls, Ohio, assignor to The L. D. Kichler Co., Cleveland, Ohio
Filed Jan. 5, 1995, Ser. No. 33,102
Term of patent 14 years
U.S. Cl. D26—84



366,716
TABLE LAMP BASE
Colleen M. Visage, Willoughby Heights, Ohio, assignor to The L.D. Kichler Co., Cleveland, Ohio
Filed Oct. 11, 1994, Ser. No. 29,412
Term of patent 14 years
U.S. Cl. D26—93

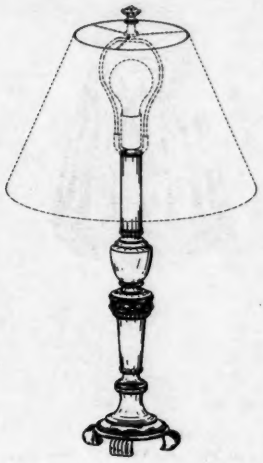


366,717
TABLE LAMP BASE
Colleen M. Visage, Willoughby Heights, Ohio, assignor to The L. D. Kichler Co., Cleveland, Ohio
Filed Oct. 11, 1994, Ser. No. 29,413
Term of patent 14 years
U.S. Cl. D26—93

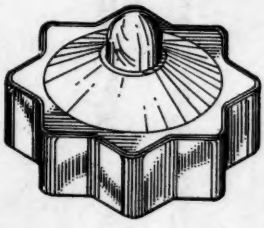
366,718
TABLE LAMP BASE
Gary M. Kattler, Chagrin Falls, Ohio, assignor to The L.D. Kichler Co., Cleveland, Ohio
Filed Oct. 11, 1994, Ser. No. 29,414
Term of patent 14 years
U.S. Cl. D26—93

366,719
TABLE LAMP BASE
David H. Porter, Chagrin Falls, Ohio, assignor to The L.D. Kichler Co., Cleveland, Ohio
Filed Oct. 11, 1994, Ser. No. 29,415
Term of patent 14 years
U.S. Cl. D26—93

366,720
TABLE LAMP BASE
Gary M. Kattler, Chagrin Falls, Ohio, assignor to The L.D. Kichler Co., Cleveland, Ohio
Filed Oct. 11, 1994, Ser. No. 29,468
Term of patent 14 years
U.S. Cl. D26—93



366,721
LIGHT FIXTURE
Robert W. Borden, 1525 E. Baseline Rd. #116, Tempe, Ariz. 85283
Continuation-in-part of Ser. No. 789,469, Nov. 8, 1991, abandoned. This application Dec. 23, 1993, Ser. No. 16,746
Term of patent 14 years
U.S. Cl. D26—110



366,722
LAMP SHADE
Ming-Tyan Yan, 58, Ma Yuan West St., Taichung, Taiwan, Prov. of China
Filed Nov. 7, 1994, Ser. No. 30,733
Term of patent 14 years
U.S. Cl. D26—125

366,723
GLASS SHADE
Chi J. Chen, No. 101, Jian-Shan, Chi-Ding Li, Jwu-Nan Jenn,, Miau-Li Hsien, Taiwan, Prov. of China
Filed Oct. 4, 1994, Ser. No. 29,344
Term of patent 14 years
U.S. Cl. D26—134

366,724
LAMPSHADE
Hsing-Min Keng, Palos Verdes Estates, and Richard W. McDowell, Palos Verdes, both of Calif., assignors to Jimway, Inc., Bell, Calif.
Filed Oct. 24, 1994, Ser. No. 30,246
Term of patent 14 years
U.S. Cl. D26—134

366,725
GLASS SHADE
Chi J. Chen, No. 101, Jian-Shan, Chi-Ding Li, Jwu-Nan Jenn, Miau-Li Hsien, Taiwan, Prov. of China
Filed Oct. 4, 1994, Ser. No. 29,346
Term of patent 14 years
U.S. Cl. D26—136

366,726
GLASS SHADE
Chun F. Sung, No. 1427, Ren-Ay Rd., Chi-Ding Li, Jwu-Nan Jenn, Miau-Li Hsien, Taiwan, Prov. of China
Filed Oct. 4, 1994, Ser. No. 29,356
Term of patent 14 years
U.S. Cl. D26—136

366,727
APPLICATOR
Anne M. Possmann, 100 Lake Ville Clr., Petaluma, Calif. 94954
Filed Aug. 19, 1991, Ser. No. 747,915
The portion of the term of this patent subsequent to Feb. 28, 2007, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—7

366,728

DISPOSABLE RAZOR HANDLE

Ki Jae Ryu, Seoul, Rep. of Korea, assignor to DORCO Co., Ltd., Kyunggi-do, Rep. of Korea

Filed Aug. 10, 1994, Ser. No. 26,961

Claims priority, application Rep. of Korea, Apr. 7, 1994, 1994-7059

Term of patent 14 years

U.S. Cl. D28—48

366,729

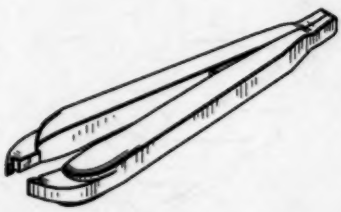
EARRING STUD TWEEZERS

Vladimir Reil, 30524 Ganado Dr., Rancho Palos Verdes, Calif. 90274

Filed Oct. 4, 1993, Ser. No. 13,864

Term of patent 14 years

U.S. Cl. D28—55



366,730

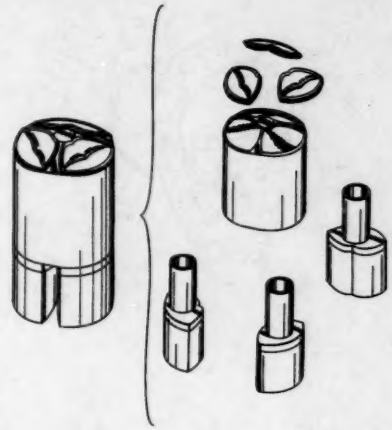
LIPSTICK KIT

Ching-Chun Chen, Taichung Hsien, Taiwan, Prov. of China, assignor to Fang Sheng Plastics Co., Ltd., Taichung Hsien, Taiwan, Prov. of China

Filed Jun. 9, 1994, Ser. No. 24,132

Term of patent 14 years

U.S. Cl. D28—86



366,731

CYCLIST HELMET

Louis Garneau, St-Augustin-de-Desmaures, Canada, assignor to Louis Garneau Sports Inc., Quebec, Canada

Filed Nov. 2, 1994, Ser. No. 30,126

Claims priority, application Canada, May 3, 1994, 1994-0876

Term of patent 14 years

U.S. Cl. D29—102

366,732

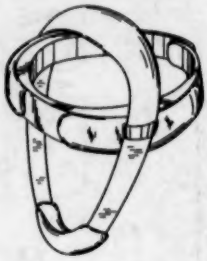
PROTECTIVE HEAD GEAR

Eugene S. Gregg, 20 Sally Port Rd., Hilton Head Island, and Thomas Wood, 100 Forest Garden, Hilton Head, both of S.C. 29928

Filed Dec. 13, 1994, Ser. No. 32,276

Term of patent 14 years

U.S. Cl. D29—108



366,733

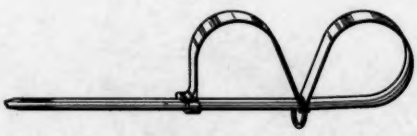
HANDCUFF

Emery J. Stanchin, 9617 Yarmouth Ct., Louisville, Ky. 40272

Filed Jul. 29, 1994, Ser. No. 26,479

Term of patent 14 years

U.S. Cl. D29—120



366,734

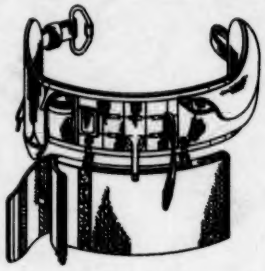
FIREFIGHTER RESCUE AND UTILITY BELT WITH DETACHABLE CARRIER

Lawrence C. Arthur, 159 Duncan Trial, Longwood, Fla. 32779

Filed Oct. 21, 1994, Ser. No. 30,173

Term of patent 14 years

U.S. Cl. D29—124



366,735

AQUARIUM TANK

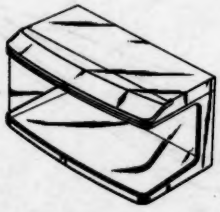
Minoru Ichikawa, Tokyo, Japan, assignor to Nisso Industry Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1993, Ser. No. 16,235

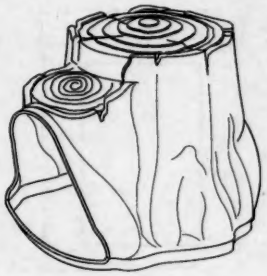
The portion of the term of this patent subsequent to Aug. 8, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D30—101

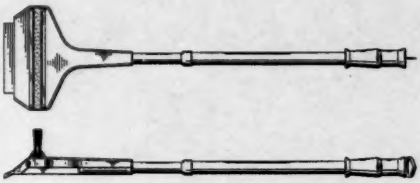


366,736
STUMP DOG HOUSE
Melaney L. Northrop, Cleburne, and Matthew J. Vallo, Frisco, both of Tex., assignors to Doskocil Manufacturing Company, Inc., Arlington, Tex.
Filed Nov. 14, 1994, Ser. No. 30,923
Term of patent 14 years
U.S. Cl. D30—112



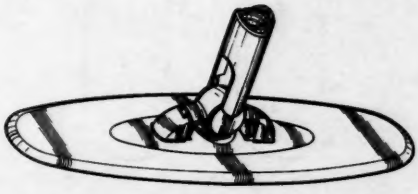
366,737
COMPACT DISC CLEANER
Yong E. Chen, Rm. C, 12th Fl., Fu Hsing North Rd., Taipei, Taiwan, Prov. of China
Filed Jul. 18, 1994, Ser. No. 26,033
Term of patent 14 years
U.S. Cl. D32—35

366,738
COMBINATION ICE SCRAPER AND SNOW BROOM
Gary P. Israel, Andover, Kans., assignor to Wescon Products Company, Wichita, Kans.
Filed Dec. 23, 1994, Ser. No. 32,695
Term of patent 14 years
U.S. Cl. D32—42

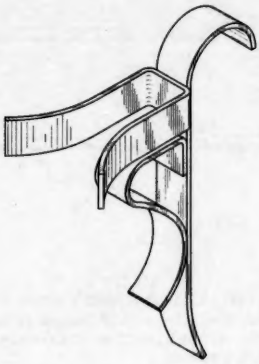


366,739
COMBINED CLEANING AND WIPING DEVICE
Tassilo von Grolman, Oberusel; Bernhard Heise, Friedberg, and Uwe Dingert, Abtsteinach, all of, Germany, assignors to Vileda GmbH, Germany
Filed Jan. 3, 1995, Ser. No. 33,011
Claims priority, application Germany, Jul. 4, 1994, M9405437.1
Term of patent 14 years
U.S. Cl. D32—42

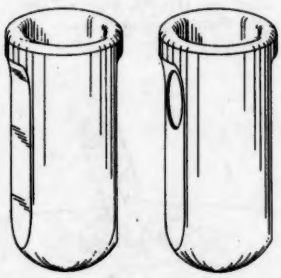
366,740
DUST MOP HEAD
Ken F. Clausen, Doylestown, and Vincent L. Haley, Orrville, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Aug. 11, 1994, Ser. No. 27,064
Term of patent 14 years
U.S. Cl. D32—50



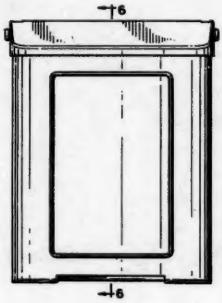
366,741
BRUSH HOLDER
Terrence A. Roehrig, 2827 Elmwood, Sylvania, Ohio 43560
Filed Oct. 19, 1994, Ser. No. 29,907
Term of patent 14 years
U.S. Cl. D32—54



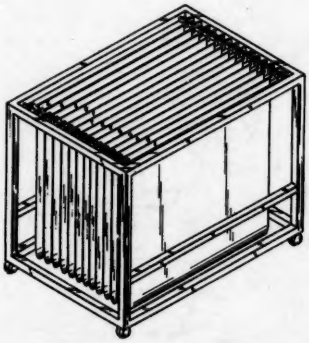
366,742
WASTE RECEPTACLE
Eric Chan, New York, N.Y., assignor to RPI Designs, Marlette, Mich.
Filed Nov. 22, 1994, Ser. No. 31,323
Term of patent 14 years
U.S. Cl. D34—1



366,743
SANITARY NAPKIN RECEPTACLE
Robert A. Davenport, Sylvania, Ohio, assignor to Impact Products, Inc., Toledo, Ohio
Filed Dec. 12, 1994, Ser. No. 32,009
Term of patent 14 years
U.S. Cl. D34—7

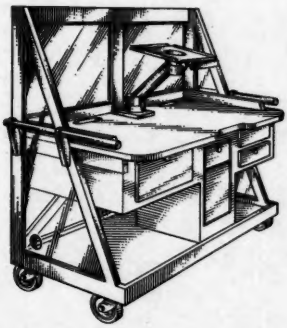


366,744
FILING CART FOR EDUCATIONAL ASSESSMENT PORTFOLIOS
Jane B. Bailey, 1601 S. Shepherd, No. 255, Houston, Tex. 77019
Filed Nov. 2, 1994, Ser. No. 30,573
Term of patent 14 years
U.S. Cl. D34—12

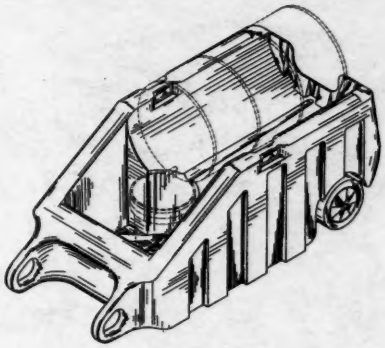


366,745
FLAT BED CART
Alan R. Kern; John A. LaFleur, both of Richmond; Goerge Hand, Midlothian, and Bruce Ferris, Richmond, all of Va., assignors to Rehrig International, Inc., Richmond, Va.
Filed Jan. 5, 1995, Ser. No. 33,121
Term of patent 14 years
U.S. Cl. D34—17

366,746
MOBILE ANALYSIS CART
William P. Jones, Gurnee, Ill., assignor to Sysmex Corporation, Long Grove, Ill.
Filed Feb. 2, 1995, Ser. No. 34,371
Term of patent 14 years
U.S. Cl. D34—20



366,747
DRUM CRADLE
Michael H. Litin, Jamesville, Wis.; James P. Onders, Independence, and John O. Milliken, Gates Mills, both of Ohio, assignors to ENPAC Corporation, Chardon, Ohio
Filed Nov. 28, 1994, Ser. No. 31,444
Term of patent 14 years
U.S. Cl. D34—12



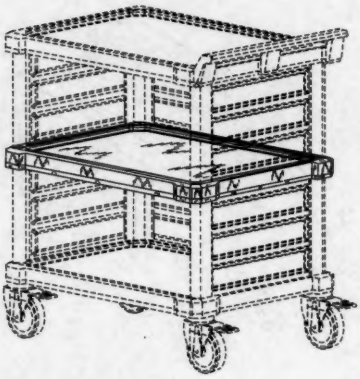
366,748
GARDEN CART
Stephen H. Harrington, 7038 Shaeff La., Fort Washington, Pa. 19034
Filed Mar. 1, 1995, Ser. No. 35,535
Term of patent 14 years
U.S. Cl. D34—24

366,749

MIDDLE SHELF FOR USE IN A BUSSING CART

Bradley J. Carlson, and Jonathan M. Daugherty, both of Wilkes-Barre, Pa., assignors to Metro Industries, Inc., Reno, Nev.

Filed Aug. 11, 1994, Ser. No. 27,129
Term of patent 14 years
U.S. Cl. D34—27



366,750

ENCLOSURE PANEL

Jonathan M. Daugherty, Wilkes-Barre, Pa., assignor to Metro Industries, Inc., Reno, Nev.

Filed Aug. 11, 1994, Ser. No. 27,130
Term of patent 14 years
U.S. Cl. D34—27

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30th DAY OF JANUARY, 1996

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.C. Nielsen Company: *See*—
Maduzia, Kenneth S.; Frett, Kenneth J.; and Vitt, James J., 5,488,408, Cl. 348-2.000.

A. O. Smith Corporation: *See*—
Ruehl, Phillip C.; Kretschmer, Stephen L.; and Behrmann, Richard J., 5,487,219, Cl. 29-897.000.

AB Volvo: *See*—
Stillbäck, Ola; and Lindahl, Lars, 5,487,685, Cl. 439-801.000.

ABB Management AG: *See*—
Eroglu, Adnan; Joos, Franz; Novacek, Peter; and Senior, Peter, 5,487,659, Cl. 431-350.000.

ABB Power T&D Company Inc.: *See*—
Kennon, Jerry M.; Murphy, Michael A.; and Shuey, Kenneth C., 5,488,565, Cl. 364-483.000.

Abbott Laboratories: *See*—
Grabenkort, Richard W., 5,487,380, Cl. 128-204.150.
Lu, Mou-Ying F.; and Reiland, Thomas L., 5,487,898, Cl. 424-435.000.
Masor, Marc L.; Katz, Gary E.; and Bynum, Douglas G., 5,488,039, Cl. 514-43.000.

Abe, Hiroshi: *See*—
Sotoya, Kohshiro; Abe, Hiroshi; Aikawa, Jun; Taniguchi, Hideki; and Nishimoto, Uichiro, 5,488,168, Cl. 564-506.000.

Abe, Hitoshi: *See*—
Ota, Yasuo; Enomoto, Masanori; and Abe, Hitoshi, 5,488,443, Cl. 351-221.000.

Abe, Masahiro; Nanataki, Tsutomu; and Yano, Shinsuke, to NGK Insulators, Ltd. Dielectric ceramic composition containing ZnO-B_2O_3-SiO_2 glass, method of preparing the same, and resonator and filter using the dielectric ceramic composition. 5,488,019, Cl. 501-139.000.

Abe, Tetsuya, to Asahi Kogaku Kogyo Kabushiki Kaisha. Apparatus for adjusting color tone of image to be recorded. 5,488,492, Cl. 358-518.000.

Abou-Charbia, Magid A.: *See*—
Failli, Amedeo A.; Bleyman, Oleg J.; Kao, Wenling; and Abou-Charbia, Magid A., 5,488,054, Cl. 514-291.000.

Abreu, Christian O., to Xerox Corporation. Liquid development system. 5,488,466, Cl. 355-256.000.

Acme Electric Corporation: *See*—
Green, Thomas W., 5,488,554, Cl. 363-25.000.

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ACS Communications, Inc.: *See*—
Lynn, Dwight D.; Reid, Kirk A.; and Chen, Shu-Ren, 5,488,657, Cl. 379-395.000.

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Greco, Robert C.; and Gore, Brian J., 5,488,650, Cl. 379-67.000.

Adachi, Hideki: *See*—
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Adachi, Rensuke: *See*—
Takahashi, Tadashi; Utsui, Tetsuya; Adachi, Rensuke; Iida, Mitsuru; Furuya, Katsuhiko; Usami, Junji; and Honda, Ryoji, 5,488,509, Cl. 359-385.000.

Adachi, Yutaka: *See*—
Kasutani, Hiroshi; Koyama, Takao; Hashimoto, Kouji; and Adachi, Yutaka, 5,487,627, Cl. 408-145.000.

Adams, George F.; and Kahwaty, Vincent N., to International Business Machines Corporation. Decoupled magnetic head assembly for quarter-inch tape. 5,488,525, Cl. 360-104.000.

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Advanced Micro Devices, Inc.: *See*—
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Advanced Spine Fixation Systems, Inc.: *See*—
Howland, Robert S., 5,487,744, Cl. 606-61.000.

Advanced Technology Materials, Inc.: *See*—
Li, Yi-Oun; and Zhang, Jiming, 5,487,356, Cl. 117-99.000.

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Sato, Masatoshi; and Masuda, Noriyuki, 5,488,325, Cl. 327-286.000.

Aebischer, Patrick; Goddard, Moses; Moldauer, John G.; Mulhauser, Paul J.; Rathbun, Anne M.; Sanberg, Paul R.; Vasconcellos, Alfred V.; and Warner, Nicholas F., to Brown University Research Foundation. Implantable therapy systems and methods. 5,487,739, Cl. 604-890.100.

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Everman, Michael R.; Murphy, David M.; and Wachholz, James J., 5,487,791, Cl. 136-245.000.

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Ahn, Ji-hong: *See*—
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Kunoff, Noah; Patel, Anant; and Melton, Robert D., 5,488,615, Cl. 371-22.400.

Aizawa, Toshiro; and Higuchi, Shigemitsu, to Hitachi, Ltd. Data recording and playback apparatus using helical scan system with magnetic head for recording and playing back pattern signal for tracking in tracking area within helical track. 5,488,520, Cl. 360-77.120.

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Ogino, Kazuya; Akahori, Kingo; Harada, Naoki; Kayane, Yutaka; Kawashita, Hideo; and Ohta, Mituhiro, 5,488,101, Cl. 534-680.000.

Akama, Terufumi: *See*—
Wakabayashi, Naoto; Tsuchiko, Masayoshi; Akama, Terufumi; Maekawa, Hiromi; Shikata, Hiroyuki; Yamazaki, Nobuo; and Kawaguchi, Tomio, 5,487,386, Cl. 128-660.010.

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Shibatani, Takeji; Komatsubara, Saburo; Omori, Kenji; and Akatsuka, Hiroyuki, 5,487,996, Cl. 435-252.100.

Akhtar, Masud. Method of depositing metal oxides. 5,487,918, Cl. 427-255.300.

Akiyama, Eitetsu: *See*—
Maruyama, Shigeru; Shimasaki, Yuichi; Kanehiro, Masaki; Hisaki, Takashi; Baba, Shigeki; Ishioka, Takuji; Takagi, Jiro; and Akiyama, Eitetsu, 5,487,676, Cl. 439-125.000.

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Albemarle Corporation: *See*—
Hu, Patrick C.; and Liimatta, Eric W., 5,487,882, Cl. 423-700.000.

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Slawson, Michael R.; and Stiscia, James J., 5,488,621, Cl. 372-31.000.

Aldridge, David L.; Bissell, Stephen R.; and Gunn, Daniel D., to Tandem Computers Incorporated. Redundant power mixing element with fault detection for DC-to-DC converter. 5,488,531, Cl. 361-18.000.

Alex Jensen A/S, Skibby: *See*—
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Alexander, Samuel E.: *See*—
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Alfano, Biagio; and Biscaldi, Edoardo, to Necchi Compressori S.r.l. Shell configuration for a hermetic compressor. 5,487,648, Cl. 417-312.000.

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Alpha-Beta Technology, Inc.: *See*—
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Peterson, Reid A.; Hill, Charles G., Jr.; and Anderson, Marc A., 5,487,774, Cl. 95-45.000.

Anderson, Neal R.: *See*—
Fox, Thomas M.; Anderson, Neal R.; and Heeren, Julius A., 5,488,662, Cl. 380-34.000.

Anderson, Peter L.; Cowell, Michael J.; and Hotek, Dan J., to Societe Civile des Brevets Henri C. Vidal. Modular block retaining wall construction and components. 5,487,623, Cl. 405-286.000.

Anderson, Ronald L. Shaft supporting bearing assembly with axially disposed cap and ball member. 5,487,612, Cl. 384-501.000.

Andersson, Roland: *See*—
Kirka, Arde; Persells, David; Andersson, Roland; and Kinoshita, Shigehiro, 5,488,308, Cl. 324-555.000.

Andonov, Radomir: *See*—
Lonardi, Emile; Andonov, Radomir; and Cimenti, Giovanni, 5,487,532, Cl. 266-271.000.

Andreassen, Leif. Device for combined use as a ladder, fender and life-buoy for boats. 5,487,349, Cl. 114-219.000.

Andrianov, Alexander K.: *See*—
Cohen, Smadar; Andrianov, Alexander K.; Wheatley, Margaret; Allcock, Harry R.; and Langer, Robert S., 5,487,390, Cl. 128-662.020.

Andritz Sprout-Bauer, Inc.: *See*—
Foresman, James D., 5,487,862, Cl. 264-142.000.

Aneja, Arun P.; Bennie, David G.; Collins, Robert J.; Frankfort, Hans Rudolf E.; Johnson, Stephen B.; Knox, Benjamin H.; and Most, Elmer E., Jr., to Du Pont de Nemours, E. I., and Company. Process of making fine polyester hollow filaments. 5,487,859, Cl. 264-103.000.

Anglia Autoflow Limited: *See*—
Tyrrell, Christopher M.; Wills, David R.; Gardiner, David V.; and Landymore, Barry W., 5,487,699, Cl. 452-66.000.

Angst, Christof; Allgeier, Hans; Heckendorn, Roland; and Wallach, Daniel, to Ciba-Geigy Corporation. 4-substituted 2-aminoalk-3-enoic. 5,488,140, Cl. 560-170.000.

Annacone, William R.; Felis, Kenneth P.; and Speliotis, Dennis E. Rigid disc substrate comprising a central hard core substrate with a hard, thermally and mechanically matched overlying smoothing layer and method for making the same. 5,487,931, Cl. 428-64.100.

Antwerpen, Werner: *See*—
Engelhardt, Fritz; Kühlwein, Jürgen; Schuler, Wilfried; Zerrer, Ralf; and Antwerpen, Werner, 5,488,123, Cl. 556-428.000.

Aoe, Shigeru: *See*—
Ryu, Tadamitsu; Kakehi, Gen; and Aoe, Shigeru, 5,488,732, Cl. 395-800.000.

Aoki, Daigo: *See*—
Sakano, Shinichi; Aoki, Daigo; Utsumi, Minoru; Akada, Masanori; and Shimizu, Osamu, 5,488,601, Cl. 369-120.000.

Aoki, Masaaki; Yokotsuka, Isao; and Ogata, Yoshihiro, to Showa Shell Sekiyu K. K. Electro-luminescence device. 5,488,266, Cl. 313-509.000.

Aoki, Tomohiro: *See*—
Mitomi, Tatsuo; Aoki, Tomohiro; Murayama, Yasushi; Uchida, Takashi; Kobayashi, Tohru; Ikkatai, Masatoshi; and Nemura, Masaharu, 5,488,399, Cl. 347-43.000.

Aoyama, Moriyuki: *See*—
Takemoto, Takatoshi; Yoshikawa, Masayoshi; Aoyama, Moriyuki; Muramatsu, Meiji; and Kawashima, Kazunari, 5,487,696, Cl. 451-105.000.

Appel, Hans; and Diem, Fritz, to Peroxid-Chemie GmbH. Method for the preparation of alkyl hydroperoxide solutions containing little or no water. 5,488,177, Cl. 568-576.000.

Apple Computer, Inc.: *See—*
Palmer, James E.; Powers, John R., III; Coleman, Patricia J.; Brewer, Gregory S.; Herman, Jeffrey A.; and Cochran, Eli, 5,488,685, Cl. 395-157.000.

Applied Materials, Inc.: *See—*
Demaray, Richard E.; Berkstresser, David E.; and Herrera, Manuel J., 5,487,822, Cl. 204-298.090.

Appolonia, Jack; Muscato, Robert; and Wittel, George, to BOC Group, Inc., The. Method and device for transmitting heating or cooling medium to a food product on a moving substrate. 5,487,908, Cl. 426-520.000.

Apt, Jerome, Jr.: *See—*
Nathenson, Richard D.; Apt, Jerome, Jr.; Uram, Martin J.; Brumbaugh, Paul M.; Brawley, Gary H.; Hackman, Donald J.; and Christenson, Brian, 5,487,229, Cl. 37-347.000.

Arai, Seiji: *See—*
Ishikawa, Masaaki; Iguchi, Michihisa; Hashizume, Hiroshi; Nakamura, Tetsuya; Satou, Kouichirou; Okano, Yoshiaki; Fukuyama, Hirotaka; Katagata, Satoshi; Ishikawa, Takashi; Arai, Seiji; Sakai, Chinobu; and Kabai, Takahito, 5,488,462, Cl. 355-215.000.

Aramaki, Satoshi: *See—*
Sato, Makoto; Ose, Takayoshi; and Aramaki, Satoshi, 5,487,503, Cl. 229-87.050.

Arasaki, Eiji: *See—*
Sakashita, Hiroshi; and Arasaki, Eiji, 5,488,526, Cl. 360-106.000.

Arch Development Corporation: *See—*
Grdina, David J., 5,488,042, Cl. 514-114.000.
Rowley, Janet D.; and Diaz, Manuel O., 5,487,970, Cl. 435-6.000.

Arco Chemical Technology: *See—*
Faraj, Mahmoud K., 5,488,176, Cl. 568-558.000.

ARCO Chemical Technology, L.P.: *See—*
Hayes, John E.; Simroth, Donald W.; and Zhou, Xinhua, 5,488,085, Cl. 525-53.000.

Argyropoulos, John N.: *See—*
Jenkins, Richard D.; Bassett, David R.; Smith, Danny E.; Argyropoulos, John N.; Loftus, James E.; and Shay, Gregory D., 5,488,180, Cl. 568-609.000.

Aria, Fariba: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; and Aria, Fariba, 5,488,183, Cl. 568-828.000.

Arian, Abbas: *See—*
Mackay, Bruce W.; and Arian, Abbas, 5,487,433, Cl. 175-78.000.

Arima, Junichi: *See—*
Harada, Shigeru; Arima, Junichi; and Fujiki, Noriaki, 5,488,014, Cl. 437-192.000.

Armen, Ardy: *See—*
Kent, George M.; and Armen, Ardy, 5,487,860, Cl. 264-103.000.

Aronsson, Joachim, to Rotech Tooling. Swivel connection. 5,488,215, Cl. 219-86.250.

Artzer, Richard F. Structural panel. 5,487,248, Cl. 52-309.120.

Aruga, Tamotsu: *See—*
Shimada, Tomoyuki; Sasaki, Masaomi; and Aruga, Tamotsu, 5,488,164, Cl. 564-426.000.

Asabuki, Hiroshi; Fujio, Masayuki; Watanabe, Takashi; Yamazaki, Susumu; and Ishida, Fumiaki, to Hitachi, Ltd. Vortex flow blower and vane wheel therefor. 5,487,639, Cl. 415-55.100.

Asada, Makoto, to THK Co., Ltd. Slide unit for linear motion. 5,487,609, Cl. 384-18.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Yuki, Tadayuki; and Kato, Iku, 5,487,716, Cl. 493-86.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Abe, Tetsuya, 5,488,492, Cl. 358-518.000.
Kirigaya, Tadayuki; Imakyure, Kaoru; Ozaki, Hiroyasu; and Kurei, Hiroshi, 5,488,446, Cl. 354-289.100.
Takahashi, Tadashi; Utsui, Tetsuya; Adachi, Rensuke; Iida, Mitsuru; Furuya, Katsuhiko; Usami, Junji; and Honda, Ryoji, 5,488,509, Cl. 359-385.000.
Tanaka, Hitoshi, 5,488,513, Cl. 359-699.000.

Asai, Akiyoshi: *See—*
Tsuruta, Kazuhiro; Himi, Hiroaki; Asai, Akiyoshi; and Fujino, Seiji, 5,488,243, Cl. 257-314.000.

Asai, Kuniaki: *See—*
Nitta, Itaru; and Asai, Kuniaki, 5,488,138, Cl. 560-144.000.

Asamura, Yoshinori: *See—*
Ueda, Tomohiro; Iotow, Takashi; Asamura, Yoshinori; Onishi, Ken; and Mishima, Hidetoshi, 5,488,482, Cl. 358-339.000.

Asanagi, Tsuneo: *See—*
Ushitora, Akihiro; Yamaguchi, Kazuo; and Asanagi, Tsuneo, 5,487,646, Cl. 417-4.000.

Asgari, Jahanbakhsh; Tran, Minh N.; and Hrovat, Davorin D., to Ford Motor Company. Method and apparatus for four wheel steering control. 5,488,555, Cl. 364-424.050.

Ash, Robert A., to Davidson Textron Inc. Method of making a covered article by vacuum drawing. 5,487,800, Cl. 156-87.000.

Ashiwake, Noriyuki: *See—*
Sato, Kazuo; Shikida, Mitsuhiro; Ohashi, Shigeo; Hatada, Toshio; Ashiwake, Noriyuki; Tanaka, Shinji; Harada, Takeshi; and Honda, Yukio, 5,488,255, Cl. 257-718.000.

Asida, Shyoji; Takahata, Haruo; and Katsuki, Takayo, to Murata Manufacturing Co., Ltd. PTC thermistor. 5,488,348, Cl. 338-22.00R.

Askman, Lars; Leonhardt, Werner; and Svahn, Ingemar, to Nestec S.A. Process for the production of cannelloni. 5,487,905, Cl. 426-297.000.

Aslam, Mohammad; and Beck, James V., to Michigan State University. Diamond film structures and methods related to same. 5,488,350, Cl. 338-225.00D.

AT&T Corp.: *See—*
Daoud, Bassel Hage, 5,487,675, Cl. 439-95.000.
Dragone, Corrado, 5,488,680, Cl. 385-24.000.
Glance, Bernard, 5,488,500, Cl. 359-127.000.
Grimes, Gary J., 5,488,425, Cl. 348-559.000.
Houck, Warren B.; Illuzzi, Vincent A.; Ricker, Mary E.; and Vidil, Richard S., 5,488,693, Cl. 395-200.050.
Hutton, Richard S.; Taylor, Gary N.; and Wheeler, David R., 5,487,967, Cl. 430-322.000.
Johnston, James D.; and Sinha, Deepen, 5,488,665, Cl. 381-2.000.
Kaplan, Marc P.; Lu, Hui-Lan; and Slutsman, Lev, 5,488,569, Cl. 364-514.00R.
Laroia, Rajiv, 5,488,633, Cl. 375-262.000.
Lee, Kuo-Hua; and Sung, Janmye, 5,488,248, Cl. 257-38.200.
Majeti, Venkata C.; Midani, Mowaffak T.; Watson, Richard J.; and Zabriskie, Kenneth A., 5,488,412, Cl. 348-10.000.
Wainwright, Paul F., 5,488,715, Cl. 395-182.020.

AT&T Global Information Solutions Company: *See—*
Crafts, Harold S., 5,488,249, Cl. 257-401.000.

Atanasyan, Alain A.; and Tarroux, Francis, to Siemens Automotive S.A. Method for monitoring the efficiency of a catalytic converter for treating exhaust gases from an internal combustion engine. 5,487,269, Cl. 60-274.000.

Athey, Phillip S.; Crump, Druce K.; and Wilson, David A., to Dow Chemical Company, The. Amino nitrile intermediate for the preparation of 2-hydroxypropyl iminodiacetic acid. 5,488,130, Cl. 558-441.000.

Atmel Corporation: *See—*
Camarota, Rafael C., 5,488,582, Cl. 365-189.050.

Atobe, Hiroshi: *See—*
Ojima, Masaki; Ohkubo, Masaharu; Itoh, Michio; Sasame, Hiroshi; Yamada, Hiromichi; Saito, Tetsuo; Kashihara, Atsushi; Kawana, Takashi; Mano, Hiroshi; Seto, Kaoru; and Atobe, Hiroshi, 5,488,487, Cl. 358-456.000.

Atrix Laboratories, Inc.: *See—*
Polson, Alan M.; Swanborn, Deryl D.; Dunn, Richard L.; Cox, Charles P.; Norton, Richard L.; Lowe, Bryan K.; and Peterson, Kenneth S., 5,487,897, Cl. 424-426.000.

ATS Medical, Inc.: *See—*
Villafana, Manuel A., 5,487,760, Cl. 623-2.000.

Atsushi Maki: *See—*
Miyazaki, Minoru, 5,487,370, Cl. 123-538.000.

Atuta, Hiroshi: *See—*
Kayashima, Kazuhiro; Kurosaki, Toshihiko; Egusa, Yo; Atuta, Hiroshi; and Yamamoto, Hiroshi, 5,488,427, Cl. 348-569.000.

Audia, James E.; Droste, James J.; and Evrard, Deborah A., to Eli Lilly and Company. Tetrahydro-pyrido-indole. 5,488,053, Cl. 514-280.000.

Ausimont S.p.A.: *See—*
Cavallotti, Claudio; Troglia, Claudio; and Garaffa, Roberto, 5,487,818, Cl. 203-41.000.
Marchionni, Giuseppe; Guarda, Pier A.; and Paganin, Maurizio, 5,488,181, Cl. 568-615.000.

Austin, Pixie A.; Fox, Duane M.; and Wiklof, Christopher A., to Intermec Corporation. System and method for automatic selection of printer control parameters. 5,488,223, Cl. 235-375.000.

Austin, Rickey G.: *See—*
Danielson, Arvin D.; Schultz, Darald R.; Silva, Dennis; Boatwright, Darrell L.; Austin, Rickey G.; and Alt, Daniel E., 5,488,575, Cl. 364-707.000.

Automatic Machinery and Electronics, Inc.: *See—*
Bushman, Ronald C.; Harris, William E., Jr.; and Foch, Roger N., 5,487,331, Cl. 99-504.000.

Avellanet, Ernesto; and Hernandez, Ernesto, to Cordis Corporation. Magnetic guidewire coupling for catheter exchange. 5,487,729, Cl. 604-96.000.

Avitall, Boaz. Atrial mapping and ablation catheter system. 5,487,385, Cl. 128-642.000.

Avitan, Isaac. Coupled differential turning control system for electric vehicle traction motors. 5,487,437, Cl. 180-6.500.

Avni, Dror: *See—*
MacWilliams, Peter D.; Avni, Dror; Liebermensch, Avi; Baransy, Anan; and Farrell, Robert L., 5,488,639, Cl. 375-355.000.

Avula, Jayachandra B.: *See—*
Vegesna, Anantakotiraju; Avula, Jayachandra B.; Jewett, Peter H.; and Mundkur, Yatin G., 5,488,729, Cl. 395-800.000.

Ayada, Michihiko: *See—*
Taguchi, Kohei; Ayada, Michihiko; and Shingu, Hideo, 5,487,866, Cl. 419-28.000.

Ayres, Sally J.: *See—*
More, Iain; Lewtas, Kenneth; Bland, Jacqueline D.; and Ayres, Sally J., 5,487,763, Cl. 44-393.000.

Baba, Shigeki: *See—*
Maruyama, Shigeru; Shimasaki, Yuichi; Kanehiro, Masaki; Hisaki, Takashi; Baba, Shigeki; Ishioka, Takuji; Takagi, Jiro; and Akiyama, Eitetsu, 5,487,676, Cl. 439-125.000.

Baba, Shinichi: *See—*

Tanabe, Noboru; Oyanagi, Shigeru; Baba, Shinichi; Kaminishi, Katsuji; Nakamura, Masaru; and Sekido, Kazunori, 5,488,735, Cl. 395-800.000.

Bach, John M.: *See*—
Vajapey, Sridhar; Krause, Paul W.; and Bach, John M., 5,488,318, Cl. 326-46.000.

Bacher, Jean-Pierre: *See*—
Reinehr, Dieter; Bacher, Jean-Pierre; and Schmitter, André, 5,488,112, Cl. 548-261.000.

Back, Gordon E.; and Greer, Jeffrey P., to International Envelope Company, Inc. Cardboard mailer packages. 5,487,826, Cl. 206-308.300.

Bacon, Edward R.: *See*—
Singh, Baldev; Bacon, Edward R.; and Robinson, Shaughnessy, 5,488,133, Cl. 424-9.450.

Bader, Martina; and Kerscher, Volker, to Roehm GmbH Chemische Fabrik. Monomer for high refractive index plastics. 5,488,128, Cl. 558-251.000.

Bagalini, Dante, to Circuit Breakers Industries Ltd. GFCI with auxiliary coil current blocking means and improved test button configuration. 5,488,303, Cl. 324-509.000.

Bailey, Warren D.; Barker, Kenenth J.; Bellinghausen, Joan M.; Calhoun, George M.; Naudin, Bernard J.; and Suffern, Edward, to International Business Machines Corporation. Coupler for providing a high speed interface between a communication controller and a controller extension. 5,488,734, Cl. 395-800.000.

Baird, William J., to Inland Container Corporation. Paperboard tray and cover assembly. 5,487,504, Cl. 229-120.170.

Baitz, Günter; and Ihlenburg, Rainer, to Siemens Nixdorf Informationssysteme Aktiengesellschaft. Weighing device for the registration of goods in stores. 5,488,202, Cl. 177-25.150.

Baker, Daniel G.; Parish, Robert W.; and Zink, Scott E., to Tektronix, Inc. Return-loss detection for serial digital source. 5,488,310, Cl. 324-648.000.

Baker Hughes Incorporated: *See*—
Crawley, Dolph R.; and Brooke, Steven R., 5,487,435, Cl. 175-363.000.
Curington, Alfred R., 5,487,427, Cl. 166-382.000.

Baker, Jay O.: *See*—
Russ, Timothy J.; Khatib, Khal M.; and Baker, Jay O., 5,487,915, Cl. 427-208.000.

Baker, Jeffrey L.: *See*—
Woodorf, Kent; Hilton, Ronald N.; Pang, Nicholas Y.; Baker, Jeffrey L.; and Nguyen, Khanh X., 5,488,706, Cl. 395-375.000.

Baker, Michael J.; Dilworth, Jonathan R.; Sunley, John G.; and Wheatley, Nigel, to BP Chemicals Limited. Process for the carbonylation of methanol or a reactive derivative thereof. 5,488,153, Cl. 562-519.000.

Bakir, Farid: *See*—
Sovak, Milos; Terry, Ronald C.; Douglass, James G., III; and Bakir, Farid, 5,487,885, Cl. 424-59.000.

Baldwin, Linda: *See*—
Oyen, Margaret A.; and Baldwin, Linda, 5,487,668, Cl. 434-98.000.

Baliga, B. Jayant; and Korec, Jacek, to North Carolina State University. Latch-up resistant bipolar transistor with trench IGFET and buried collector. 5,488,236, Cl. 257-132.000.

Balkovich, Edward: *See*—
Schneider, Fred B.; Lampson, Butler; Balkovich, Edward; and Thiel, David, 5,488,716, Cl. 395-182.080.

Ball, Johannes; Henseler, Wolfgang; Gerstenberg, Uwe; and Fischer, Thomas, to Mercedes-Benz AG. Instrument panel in a motor vehicle. 5,487,558, Cl. 280-728.300.

Ball, Randall W. Pliant unitary coupling element dual handled shovel. 5,487,577, Cl. 294-58.000.

Balmer, Oskar: *See*—
Fockz, Heinz; and Balmer, Oskar, 5,487,461, Cl. 198-571.000.

Bando Chemical Industries, Ltd.: *See*—
Shirota, Yasuhiro; Inada, Hiroshi; Yonemoto, Yoshinobu; Wakimoto, Takeo; and Imai, Kunio, 5,487,953, Cl. 428-690.000.

Banjanin, Zoran B.; and Kim, Jin, to Siemens Medical Systems, Inc. Ultrasonic Doppler imager having an adaptive tissue rejection filter with enhanced tissue motion sensitivity. 5,487,389, Cl. 128-661.090.

Banyu Pharmaceutical Co., Ltd.: *See*—
Nomoto, Takashi; Hayashi, Masahiro; Shibata, Jun; Iwasawa, Yoshikazu; Mitsuya, Morihiro; Iida, Yoshiaki; Nonoshita, Katsumasa; and Nagata, Yasufumi, 5,488,149, Cl. 562-449.000.

Baradel, Christophe; Eychenne, Yves; and Kohen, Bruno, to Cegelec. Software system having replicated objects and using dynamic messaging, in particular for a monitoring/control installation of redundant architecture. 5,488,723, Cl. 395-700.000.

Baraldi, Mario: *See*—
Costa, Erminio; Guidotti, Alessandro; Baraldi, Mario; Bertolino, Marcella; DiBella, Maria; and Vicini, Stefano, 5,488,049, Cl. 514-223.200.

Baran, John S.: *See*—
Chen, Barbara B.; Hansen, Gunnar J.; and Baran, John S., 5,488,066, Cl. 514-618.000.

Baranny, Anan: *See*—
MacWilliams, Peter D.; Avni, Dror; Liebermensch, Avi; Baranny, Anan; and Furrell, Robert L., 5,488,639, Cl. 375-355.000.

Barberis, Pierre: *See*—
Dumas, Gerard; Barberis, Pierre; and Bunel, Gerard, 5,487,797, Cl. 148-672.000.

Barbier, Alain; and Lacheretz, Frederic, to Sanofi. Method of promoting bone repair using tiludronic disodium salt. 5,488,041, Cl. 514-108.000.

Bardy, Marie-Claude, to Thomson-CSF. Method for the management of the beam of an electronically scanned rotating antenna. 5,488,381, Cl. 342-372.000.

Barfield, Marvin W. Ornamental tree flower pot displays. 5,487,476, Cl. 211-71.000.

Barker, Kenenth J.: *See*—
Bailey, Warren D.; Barker, Kenenth J.; Bellinghausen, Joan M.; Calhoun, George M.; Naudin, Bernard J.; and Suffern, Edward, 5,488,734, Cl. 395-800.000.

Barnes, David A.: *See*—
Jones, Anthony M.; and Barnes, David A., 5,488,646, Cl. 377-47.000.

Barnes, Derek, to MacMillan Bloedel Limited. Short strand orienter. 5,487,460, Cl. 198-382.000.

Barnsley, Peter E., to British Telecommunications plc. Optical processing system. 5,488,501, Cl. 359-137.000.

Baroni, Marco; Cecchi, Roberto; and Croci, Tiziano, to Sanofi. {(7S)-7-[(2R)-2-(3-chlorophenyl)-2-hydroxyethylamino)-2-hydroxyethylamino]5,6,7,8-tetrahydronaphthalen-2-yloxy} acetic acid and its pharmaceutically acceptable salts. 5,488,151, Cl. 562-452.000.

Barr, Sophia C.: *See*—
Carter, Robert L.; and Barr, Sophia C., 5,487,535, Cl. 267-220.000.

Barrett, David W.; McHugh, Thomas M.; Ahigian, Edward E.; Jaminet, Jerome F.; He, Thomas; Peruggi, Richard E.; Kowalcyk, Thomas M.; and Kulak, Richard E., to Otis Elevator Company. Magnetic elevator door coupling. 5,487,449, Cl. 187-330.000.

Bartilucci, Anthony R.; Gilchrist, George W.; and Yurman, Richard, to Northrop Grumman Corporation. Molding composite by positioning heat-conductive mat between platen and tool. 5,487,864, Cl. 264-219.000.

Bartmann, Ekkehard: *See*—
Reiffenrath, Volker; Kurmeier, Hans A.; Poetsch, Eike; Plach, Herbert; Finkenzeller, Ulrich; Bartmann, Ekkehard; Krause, Joachim; and Scheuble, Bernhard, 5,487,845, Cl. 252-299.630.

Basch, Lauren R.: *See*—
Hassel, David R.; and Basch, Lauren R., 5,488,203, Cl. 177-184.000.

BASF Aktiengesellschaft: *See*—
Boeckh, Dieter; Funhof, Angelika; Kroner, Matthias; Hartmann, Heinrich; Baur, Richard; Kud, Alexander; and Schwendemann, Volker, 5,488,095, Cl. 528-361.000.
Dyllick-Brenzinger, Rainer; Raulfs, Friedrich-Wilhelm; Schlösser, Ulrike; Beck, Karin H.; and Scholz, Gerhard, 5,487,770, Cl. 44-328.000.
Hamprecht, Gerhard; Mayer, Horst; Westphalen, Karl-Otto; Gerber, Matthias; Kardorff, Uwe; and Walter, Helmut, 5,488,029, Cl. 504-212.000.
Marschner, Claus; and Patsch, Manfred, 5,488,100, Cl. 534-618.000.
Marschner, Claus; and Patsch, Manfred, 5,488,127, Cl. 558-25.000.

BASF Corporation: *See*—
Green, Todd J., 5,488,072, Cl. 521-129.000.
Kent, George M.; and Armen, Ardy, 5,487,860, Cl. 264-103.000.
Mason, Charles M.; and Sutton, Ted L., 5,487,836, Cl. 210-791.000.
Patterson, Jimmy L., 5,488,071, Cl. 521-114.000.
Saraf, Anil W., 5,487,856, Cl. 264-78.000.

BASF Schwarzheide GmbH: *See*—
Falke, Peter; Seifert, Holger; and Heinz, Marion, 5,488,070, Cl. 521-51.000.
Mueller-Hagen, Gerd; Hrianrich, Horst; and Meyer, Baerbel, 5,488,074, Cl. 521-172.000.

Bassett, David R.: *See*—
Jenkins, Richard D.; Bassett, David R.; Smith, Danny E.; Argyropoulos, John N.; Loftus, James E.; and Shay, Gregory D., 5,488,180, Cl. 568-609.000.

Bastyr, Charles A.; and Kolen, Paul T. Nerve stimulating device and associated support device. 5,487,759, Cl. 607-149.000.

Battelle Memorial Institute: *See*—
McGinniss, Vincent D.; Dick, Richard J.; Russell, Robert E., III; and Rogers, Stephen D., 5,487,946, Cl. 428-413.000.

Batzill, Manfred; Esch, Hans-Joachim; Mezger, Hans; Distelrath, Winfried; and Reustle, Albrecht, to Dr. Ing. h.c.F. Porsche AG. Internal-combustion engine comprising two cylinder banks. 5,487,363, Cl. 123-41.740.

Bauer, Fred P.; Sanders, Stuart E.; Van Wagener, Raymond H.; and Opperthauser, Mark R., to Magnetek, Inc. Electrical connector with improved centering of mating terminal pins, for a fluorescent-lighting ballast. 5,488,268, Cl. 315-70.000.

Bauer, Klaus; and Bieringer, Hermann, to Hoechst Aktiengesellschaft. Herbicide-safener combinations containing sulfonylurea or imidazolinone herbicides. 5,488,027, Cl. 504-105.000.

Bauer, William, Jr.; Quiros, Nelson I.; and Upmacis, Rita K., to Rohm and Haas Company. Removal of carbonyl impurities from αβ unsaturated carboxylic acid esters. 5,488,141, Cl. 560-218.000.

Baum, Eric A.: *See*—
Robertson, Paul A.; Houzego, Peter J.; Jensen, Borge R.; Creeke, Murray A.; Emerton, Neil; Hodson, Peter D.; and Baum, Eric A., 5,487,378, Cl. 128-200.160.

Baur, Richard: *See*—
Boeckh, Dieter; Funhof, Angelika; Kroner, Matthias; Hartmann, Heinrich; Baur, Richard; Kud, Alexander; and Schwendemann, Volker, 5,488,095, Cl. 528-361.000.

Baversten, Bengt I., to Combustion Engineering, Inc. Method and apparatus for supporting a shroud in a nuclear reactor. 5,488,643, Cl. 376-390.000.

Bayer AG: *See*—

Thurm, Siegfried; Sommer, Klaus; Bier, Peter; Elschner, Andreas; Kowitz, Manfred; and Sandquist, Axel, 5,487,810, Cl. 216-67.000.
Wood, Louis L.; and Calton, Gary J., 5,488,088, Cl. 525-432.000.

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Haas, Wilhelm; Müller, Klaus-Helmut; König, Klaus; Santel, Hans-Joachim; Lürssen, Klaus; and Schmidt, Robert R., 5,488,028, Cl. 504-193.000.
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Fueller, Peter; Kuebler, Juergen; Guett, Herbert; and Amaseder, Franz, 5,487,564, Cl. 280-808.000.

Baylis, Eric K., to Ciba-Geigy Corporation. Phosphinate esters. 5,488,171, Cl. 568-8.000.

Bayliss, John P.; and Byrnes, Sean, to Lucas Industries. Vehicle brake servo booster with traction control mode. 5,487,325, Cl. 91-376.00R.

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Beason, Ronnie B.: *See*—
Fagan, John E.; Sluss, James J., Jr.; Hassell, John W.; Mears, R. Brian; Beason, Ronnie B.; Wilkinson, Sonja R.; Lear, Tommy; and Tan, Kok S., 5,488,224, Cl. 250-227.160.

Beck, James V.: *See*—
Aslam, Mohammad; and Beck, James V., 5,488,350, Cl. 338-225.00D.

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Beck, Robert L.: *See*—
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Caizza, Richard J.; and Bell, Jon S., 5,487,733, Cl. 604-110.000.
Meyer, Gabriel, 5,487,737, Cl. 604-403.000.

Behrmann, Richard J.: *See*—
Ruehl, Phillip C.; Kretschmer, Stephen L.; and Behrmann, Richard J., 5,487,219, Cl. 29-897.000.

Beier, Wolfgang: *See*—
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Bailey, Warren D.; Barker, Kenenth J.; Bellinghausen, Joan M.; Calhoun, George M.; Naudin, Bernard J.; and Suffern, Edward, 5,488,734, Cl. 395-800.000.

Belmont, Brian V., to Compaq Computer Corp. Portable computer system for docking to an expansion base unit. 5,488,572, Cl. 364-514.00R.

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Benchmark Research and Technology, Inc.: *See*—
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Bend All Manufacturing Inc.: *See*—
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Moinard, Patrice; Thioux, Alain; and Mery, Jean Claude, 5,487,452, Cl. 188-72.700.

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Benfatto, Anthony, to Bristol-Myers Squibb Company. Clear antiperspirant roll-on compositions. 5,487,887, Cl. 424-66.000.

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Aneja, Arun P.; Bennie, David G.; Collins, Robert J.; Frankfort, Hans Rudolf E.; Johnson, Stephen B.; Knox, Benjamin H.; and Most, Elmer E., Jr., 5,487,859, Cl. 264-103.000.

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McDow, Timothy S.; and Bensinger, Marlin, 5,487,871, Cl. 422-80.000.

Benson, Cory D., to GNB Battery Technologies, Inc. Lead delivery system for casting straps in the manufacture and assembly of lead-acid batteries. 5,487,496, Cl. 222-593.000.

Benson, Miriam M.: *See*—
Hutchison, Joel P., 5,487,344, Cl. 108-51.300.

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Bergetz, Carl A., to Peerless Industries, Inc. Mounting assembly with forced absorption characteristics. 5,487,524, Cl. 248-613.000.

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Berkowitz, Peter N.; Papadopoulos, Michael N.; Colwell, Larry W.; and Moran, Martin K., to Continental Controls, Inc. Multivariable process control method and apparatus. 5,488,561, Cl. 364-165.000.

Berkstresser, David E.: *See*—
Demaray, Richard E.; Berkstresser, David E.; and Herrera, Manuel J., 5,487,822, Cl. 204-298.090.

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Froelich, Thomas E., Sr.; and Bertka, Jeffrey T., 5,487,709, Cl. 482-46.000.

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Costa, Erminio; Guidotti, Alessandro; Baraldi, Mario; Bertolino, Mariella; DiBella, Maria; and Vicini, Stefano, 5,488,049, Cl. 514-223.200.

Bertva, John T.; Hutto, Scott L.; and McCrady, John M., to Wynns Climate Systems, Inc. Mounting bracket for a heat exchanger. 5,487,422, Cl. 165-67.000.

Bessler, Warren F., to General Electric Company. Independent compartment temperature control in a household refrigerator using interlinked thermostats. 5,487,277, Cl. 62-187.000.

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Bianchini, Eber C.; Knoerzer, Anthony R.; Parr, Larry A.; and Reid, Leland W., to Mobil Oil Corp. Oxygen and moisture barrier metallized film structure. 5,487,940, Cl. 428-349.000.

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Fairbanks, Floyd B.; Snell, Thomas G.; and McDonough, James M., 5,487,657, Cl. 431-153.000.

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Biggio, Kenneth: *See*—
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Binney & Smith Inc.: *See*—
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Sovak, Milos; Terry, Ronald C.; Douglass, James G., III; and Bakir, Farid, 5,487,885, Cl. 424-59.000.

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Alfano, Biagio; and Biscaldi, Edoardo, 5,487,648, Cl. 417-312.000.

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Bishop, Charles W.: *See*—
Knutson, Joyce C.; Bishop, Charles W.; and Moriarty, Robert M., 5,488,120, Cl. 552-653.000.
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Safferman, Steven I.; and Bishop, Paul L., 5,487,829, Cl. 210-151.000.
Bissell, Stephen R.: *See*—
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Bjorkquist, David W.; and Panandiker, Rajan K., to Procter & Gamble Company, The. β-aminoalkyl and β-N-peptidylaminoalkyl boronic acids. 5,488,157, Cl. 562-7.000.
Black, Billie E., to Black, Billie Eugene. Energizing devices for kilowatt hour meter displays. 5,488,290, Cl. 324-74.000.
Black, Billie Eugene: *See*—
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Demarest, David; Duncan, Robert B.; Sobel, Martin; Lenihan, Timothy P.; Rattan, William; Blanch, John F.; Hodulik, Michael G.; and Yost, Dennis P., 5,487,212, Cl. 29-407.000.
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Bloom, David M.; Ho, Francis; and Hou, Alfred S., to Leland Stanford Junior University, The Board of Trustees of the. System and method for high-speed potentiometry using scanning probe microscope. 5,488,305, Cl. 324-537.000.
Blue Marble Research, Inc.: *See*—
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Appolonia, Jack; Muscato, Robert; and Wittel, George, 5,487,908, Cl. 426-520.000.
LaCava, Alberto; and McKeigue, Kevin, 5,487,775, Cl. 95-98.000.
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Ramachandran, Ramakrishnan; and Dao, Loc H., 5,488,185, Cl. 568-896.000.
Sieck, Peter A.; Hill, Russell J.; Vossen, John L.; and Schulz, Stephen C., 5,487,821, Cl. 204-192.120.
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Boehringer Ingelheim KG: *See*—
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Bogdanski, Franz: *See*—
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Bonaccio, Anthony R., to International Business Machines Corp. Open and short fault detector for a differential interface. 5,488,306, Cl. 324-539.000.
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Bonavia, Howard V.; and Geislinger, Dale F., to Simmonds Precision Engine Systems, Inc. Exciter circuit using gated switches. 5,488,536, Cl. 361-253.000.
Bonniau, Philippe; and Chazelas, Jean, to Thomson - CSF. Device for the airtight closing of a package with fast open-and-shut system. 5,487,484, Cl. 220-201.000.
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Boonstra, Eric F.: *See*—
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Booth, James J.: *See*—
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Borden, Inc.: *See*—
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Borkowicz, Richard J.; Davis, L. Berkley, Jr.; and Kuwata, Masayoshi, to General Electric Co. Tertiary fuel injection system for use in a dry low NOx combustion system. 5,487,275, Cl. 60-747.000.
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Brackett, Anne W.; Durham, Marcus O.; Perkins, Lynn K.; and Thoman, Gregory E., to W. L. Walker Co., Inc. Tank gauging apparatus and method. 5,487,300, Cl. 73-61.590.
Bradley, Benjamin A. D. B.; Doyle, Alan; and Kumpel, Belinda M., to National Blood Authority. Human anti-RH(D) monoclonal antibodies reagents and hybridomas and methods of RH typing using anti-RH(D) monoclonal antibodies and reagents. 5,487,891, Cl. 424-142.100.
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Brady, James T.; and Menon, Jaishankar M., to International Business Machines Corporation. In log sparing for log structured arrays. 5,488,701, Cl. 395-182.040.
Braginsky, Asik: *See*—
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Brault, Donald A.: *See—*
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Braun, Augustinus L.: *See—*
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Brennan, Thomas J.; DeFillipi, Michael E.; Gnyp, Steven M.; and Kremer, Gregory D., to Johnstone Pump Company. Mastic applicator system. 5,487,781, Cl. 118-300.000.

Breslin, Michael K. Pneumatically powered submersible fluids pump with casing activator and biasing means. 5,487,647, Cl. 417-131.000.

Brett, Hans: *See—*
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Bromley, Steven D.; Herrmann, James F.; and Emery, Mark V. Adaptive backup battery management for vehicular based electronic modules. 5,487,956, Cl. 429-90.000.

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Brooktrout Technology, Inc.: *See—*
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Broskow, James A., to Illinois Tool Works Inc. Container carrier. 5,487,465, Cl. 206-150.000.

Brosnan, Kerry R. Light - reflecting waveguide assemblies and process. 5,488,696, Cl. 385-129.000.

Brotherton, Stanley D., to U.S. Philips Corporation. Manufacture of electronic devices comprising thin-film transistors using an ion implantation mask having bevelled edges. 5,488,001, Cl. 437-21.000.

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Grabowski, David N., 5,487,519, Cl. 248-311.200.

Cho, Chih-Chen: *See*—
Havemann, Robert H.; Jeng, Shin-Puu; Gnade, Bruce E.; and Cho, Chih-Chen, 5,488,015, Cl. 437-195.000.

Cho, Joong M.: *See*—
Kim, Sung-Hou; and Cho, Joong M., 5,487,983, Cl. 435-69.100.

Cho, Nam-Sik, to Samsung Electronics Co., Ltd. Motor mount for an electrical motor. 5,488,259, Cl. 310-91.000.

Cho, Wan J., to LG Industrial Systems Co., Ltd. Vending machine. 5,487,488, Cl. 221-150.0HC.

Cho, Won S., to Goldstar Co., Ltd. Color video printer which enables a pattern generation process when no synchronizing signals are detected. 5,488,690, Cl. 395-109.000.

Choi, Min K. Restroom organizer and sterilizing apparatus. 5,487,877, Cl. 422-300.000.

Choi, Soon C.; and Jeon, Ki U., to Samsung Electronics Co., Ltd. Liquid crystal projector. 5,488,436, Cl. 348-751.000.

Choi, Young-Wan: *See*—
Kwon, O-Kyun; Choi, Young-Wan; and Lee, El-Hang, 5,488,231, Cl. 257-17.000.

Chong, Siew-Tan: *See*—
Hui, Lucas Y. W.; and Chong, Siew-Tan, 5,488,419, Cl. 348-402.000.

Choy, Jin-Ho: *See*—
Oh, Young Jei; Choy, Jin-Ho; Jung, Hyung Jin; Han, Yang Su; and Song, Seung Wan, 5,487,878, Cl. 423-140.000.

Christensen, Børge H. Method for coating particles in a spray-drying plant. 5,487,916, Cl. 427-213.000.

Christensen, Craig: *See*—
Campbell, Ronald; Campbell, Gaylon; and Christensen, Craig, 5,487,702, Cl. 460-7.000.

Christenson, Brian: *See*—
Nathenson, Richard D.; Apt, Jerome, Jr.; Uram, Martin J.; Brumbaugh, Paul M.; Brawley, Gary H.; Hackman, Donald J.; and Christenson, Brian, 5,487,229, Cl. 37-347.000.

Chrusciel, Robert A.; Hagen, Timothy J.; Hallinan, E. Ann; Li, Jinglin; Tsymbalov, Sofya; and Reitz, David B., to G. D. Searle & Co. Carbamic acid derivatives of substituted dibenzoxazepine compounds, pharmaceutical compositions and methods of use. 5,488,046, Cl. 514-211.000.

Chrysler Corporation: *See—*
Carter, Robert L.; and Barr, Sophia C., 5,487,535, Cl. 267-220.000.

Chu, Alice S.; Jackson, Andrew; and Wu, Margaret M., to Mobil Oil Corporation. Hydrocarbon lube and distillate fuel additive. 5,488,191, Cl. 585-10.000.

Chum, Pak-Wing S.: *See—*
Spencer, Lee; Kolthammer, Brian W. S.; Ripplinger, Miriam P.; Wooster, Jeffrey J.; Chum, Pak-Wing S.; and deGroot, Jacquelyn A., 5,487,938, Cl. 428-332.000.

Chung, Chen-Hui: *See—*
Hsue, Chen-Chiu; Shen, Yi-Chung; Sheu, Shing-Ren; and Chung, Chen-Hui, 5,488,009, Cl. 437-52.000.

Chung, Hae Y.: *See—*
Kim, Jung H.; Chung, Hae Y.; Kim, Hyung S.; Lee, Byeong H.; and Roh, Young H., 5,487,284, Cl. 68-3.0SS.

Chunghwa Picture Tubes, Ltd.: *See—*
Chen, Hsing-Yao, 5,488,265, Cl. 313-414.000.

Church & Dwight Co., Inc.: *See—*
Shank, James D., 5,487,695, Cl. 451-102.000.

Ciba-Geigy Corporation: *See—*
Angst, Christof; Allgeier, Hans; Heckendorn, Roland; and Wallach, Daniel, 5,488,140, Cl. 560-170.000.
Baylis, Eric K., 5,488,171, Cl. 568-8.000.
Fischer-Reimann, Evelyn; and Fischer, Walter, 5,488,119, Cl. 552-201.000.
Käser, Adolf, 5,487,761, Cl. 8-527.000.
Leppard, David G.; Burdeska, Kurt; and Slongo, Mario, 5,488,108, Cl. 544-216.000.
Morrissey, Michael M., 5,488,160, Cl. 564-165.000.
Nesvadba, Peter, 5,488,117, Cl. 549-302.000.
Reinehr, Dieter; Bacher, Jean-Pierre; and Schmitter, André, 5,488,112, Cl. 548-261.000.
Steinmann, Bettina; Schulthess, Adrian; and Hunziker, Max, 5,487,966, Cl. 430-269.000.
Vetter, Dirk, 5,488,102, Cl. 536-32.000.

Cimenti, Giovanni: *See—*
Lonardi, Emile; Andonov, Radomir; and Cimenti, Giovanni, 5,487,532, Cl. 266-271.000.

Circuit Breakers Industries Ltd.: *See—*
Bagalini, Dante, 5,488,303, Cl. 324-509.000.

Cirrus Logic, Inc.: *See—*
Reinert, Christopher L.; and Sharma, Sudhir, 5,488,390, Cl. 345-145.000.

Citizen Watch Co., Ltd.: *See—*
Wakita, Maki, 5,488,538, Cl. 361-685.000.

Clapper, Ronald C., Jr. Electronic gaming apparatus and method. 5,487,544, Cl. 273-138.00A.

Clark, Michael C.: *See—*
Schedegger, Charles E.; Allen, Clyde G.; Clark, Michael C.; Nurenberg, Aundrea; and Wnuk, Jack, 5,487,701, Cl. 454-271.000.

Clark, Richard S.: *See—*
Dalton, William S.; Dalton, Patrick S.; and Clark, Richard S., 5,487,549, Cl. 277-54.000.

Clark, Thomas: *See—*
Miller, J. Clayton; Harvey, Michael; Taylor, James L.; Clark, Thomas; and Dawson, Gerry, 5,487,290, Cl. 70-303.00A.

Clark, Wesley R.: *See—*
Leuthold, Hans; Jennings, David J.; Clark, Wesley R.; Khan, Raquib; and Heine, Guenther, 5,487,608, Cl. 384-113.000.

Clarke, William A. Baby carousel. 5,487,705, Cl. 472-29.000.

Clary, Cynthia G.: *See—*
Clary, Michael S., 5,487,402, Cl. 135-87.000.

Clary, Michael S., to Clary, Michael S.; and Clary, Cynthia G. Portable shelter with expandable frame. 5,487,402, Cl. 135-87.000.

Cline, Jack R.: *See—*
Masghati, Mohammad; and Cline, Jack R., 5,488,535, Cl. 361-119.000.

Clinical Innovation Associates, Inc.: *See—*
Smith, Steven R.; Cutler, Christopher A.; and Wallace, William D., 5,487,377, Cl. 600-204.000.

Clouth Gummiwerke Aktiengesellschaft: *See—*
Engst, Wilhelm; Repczuk, Alexander; and Weller, Horst, 5,487,501, Cl. 238-2.000.

CMD Corporation: *See—*
Saindon, Stephen A.; Heindel, Kevin O.; and Morrow, James G., 5,488,480, Cl. 356-429.000.

Cobb, Vicky S.; Gutek, Beth I.; and Le Grow, Gary E., to Dow Corning Corporation. Alkylpolyether siloxanes. 5,488,124, Cl. 556-445.000.

Cochran, Eli: *See—*
Palmer, James E.; Powers, John R., III; Coleman, Patricia J.; Brewer, Gregory S.; Herman, Jeffrey A.; and Cochran, Eli, 5,488,685, Cl. 395-157.000.

Cochran, William A. Vision control glasses. 5,488,438, Cl. 351-45.000.

CODEV Corp.: *See—*
Estes, David W., 5,487,490, Cl. 222-1.000.

Cody, Delbert J. Saw guide apparatus. 5,487,319, Cl. 83-745.000.

Coelho, Rohan: *See—*
Keith, Michael; Coelho, Rohan; Golin, Stuart; and Nickerson, Brian, 5,488,568, Cl. 364-514.00R.

Cohen, Smadar; Andrianov, Alexander K.; Wheatley, Margaret; Allcock, Harry R.; and Langer, Robert S., to Massachusetts Institute of Technology; and Penn State Research Foundation, The. Gas-filled polymeric microbubbles for ultrasound imaging. 5,487,390, Cl. 128-662.020.

Cole, Josephine A.; and Muderlak, Kenneth J. Hanging file system and apparatus. 5,487,617, Cl. 402-4.000.

Cole, Michael L., to Eulmi, Sam H. Recursive data compression. 5,488,364, Cl. 341-50.000.

Coleman, Patricia J.: *See—*
Palmer, James E.; Powers, John R., III; Coleman, Patricia J.; Brewer, Gregory S.; Herman, Jeffrey A.; and Cochran, Eli, 5,488,685, Cl. 395-157.000.

Colgate-Palmolive Company: *See—*
Dixit, Nagaraj; Durga, Gary; Burke, Michael R.; Prencipe, Michael; and Patel, Suryakant, 5,487,906, Cl. 424-673.000.

Colley, Jaime B., to Rockwell International Corporation. Method and apparatus for determining positions on the earth corresponding to an observed rate of change of satellite range. 5,488,378, Cl. 342-357.000.

Collier Campbell Ltd.: *See—*
Collier, Susan J., 5,487,936, Cl. 428-229.000.

Collier, Susan J., to Collier Campbell Ltd. Textile fabrics of differential weave comprising multifilament threads wherein individual filaments have a linear density of one decitex or less. 5,487,936, Cl. 428-229.000.

Collins, Robert J.: *See—*
Aneja, Arun P.; Bennie, David G.; Collins, Robert J.; Frankfort, Hans Rudolf E.; Johnson, Stephen B.; Knox, Benjamin H.; and Most, Elmer E., Jr., 5,487,859, Cl. 264-103.000.

Colombo, Maristella: *See—*
Buzzetti, Franco; Longo, Antonio; and Colombo, Maristella, 5,488,057, Cl. 514-312.000.

Colony, James L.: *See—*
Subramanian, Ramaswamy; and Colony, James L., 5,488,126, Cl. 558-17.000.

Colorado State University Research Foundation: *See—*
Nett, Torrance M.; and Glode, Leonard M., 5,488,036, Cl. 514-15.000.

Colwell, Larry W.: *See—*
Berkowitz, Peter N.; Papadopoulos, Michael N.; Colwell, Larry W.; and Moran, Martin K., 5,488,561, Cl. 364-165.000.

Combot-Courrau, Yves; Le Saint, Benoit; Musellec, Jean-Noël; and Le Quere, Philippe, to Legris S.A. Quick-connection coupling. 5,487,572, Cl. 285-308.000.

Combustion Engineering, Inc.: *See—*
Baversten, Bengt I., 5,488,643, Cl. 376-390.000.

ComByte, Inc.: *See—*
Peace, Steven L.; and Precht, Terry A., 5,488,522, Cl. 360-99.060.

Compaq Computer Corp.: *See—*
Belmont, Brian V., 5,488,572, Cl. 364-514.00R.
Wood, Paul B.; and Bounds, Brian F., 5,488,393, Cl. 345-213.000.

Complex Chemicals, Corp.: *See—*
Jackson, Thomas C., 5,488,122, Cl. 556-8.000.

Comsat Corporation: *See—*
Dimolitsas, Spiros; Onufry, Michael, Jr.; and Rieser, Jack H., 5,488,653, Cl. 379-100.000.

Conair Corporation: *See—*
Sansone, Arthur J.; and Braginsky, Asik, 5,487,511, Cl. 241-282.100.

Conair Group, Inc., The: *See—*
Downie, John P., 5,487,225, Cl. 34-473.000.

Connell Limited Partnership: *See—*
Gerhart, Roland T.; and Fidziukiewicz, Erich D., 5,487,296, Cl. 72-381.000.

Conner Peripherals, Inc.: *See—*
Lemke, James U.; and French, William W., 5,488,521, Cl. 360-97.020.

Consolidated Edison Company of New York, Inc.: *See—*
Malik, Paul; Kosson, Robert; Vasely, Michael; and Stegmann, George, 5,488,642, Cl. 376-272.000.

Conte, Ubaldo; La Manna, Aldo; and Maggi, Lauretta, to Ekita Investments N.V. Process for preparing pharmaceutical tablet capable of releasing the active ingredients contained therein at subsequent times. 5,487,901, Cl. 424-472.000.

Conti Florentia S.R.L.: *See—*
Frullini, Alberto; and Frullini, Paolo, 5,487,281, Cl. 66-13.000.

Continental Controls, Inc.: *See—*
Berkowitz, Peter N.; Papadopoulos, Michael N.; Colwell, Larry W.; and Moran, Martin K., 5,488,561, Cl. 364-165.000.

Contreras, Edward A.: *See—*
Carmo, Robert A.; and Contreras, Edward A., 5,487,581, Cl. 294-137.000.

Cookson, Christopher J.: *See—*
Lieberfarb, Warren N.; Cookson, Christopher J.; and Ostrover, Lewis S., 5,488,410, Cl. 348-5.500.

Coolbear, Bruce S.: *See—*
Miller, Mitchell E.; Ferry, Julian J.; Kilbey, Brian E.; Coolbear, Bruce S.; and Gandy, Richard F., 5,487,682, Cl. 439-607.000.

Cooper, Daniel: *See—*
MacCarter, Dean J.; Hopper, Don; Cooper, Daniel; and Hassell, Roger, 5,487,753, Cl. 607-017.000.

Copeland Corporation: *See—*
Wallis, Frank S.; Houghtby, Timothy R.; Monnier, Kenneth J.; and Weatherston, Roger C., 5,487,654, Cl. 418-55.100.

Copperthwaite, Richard G.: *See*—
Hutchin, Graham J.; Themistocleous, Themistoclis; and Copperthwaite, Richard G., 5,488,165, Cl. 564-479.000.

Cordes, John. Sewing machine with elongated arm and strengtheing plate. 5,487,348, Cl. 112-259.000.

Cordis Corporation: *See*—
Avellanet, Ernesto; and Hernandez, Ernesto, 5,487,729, Cl. 604-96.000.

Cornell Research Foundation, Inc.: *See*—
Soderlund, David M.; Knipple, Douglas C.; and Henderson, Joseph E., 5,487,976, Cl. 435-7.210.

Corning Incorporated: *See*—
Cunningham, George M.; Frost, Rodney I.; and Lachman, Irwin M., 5,487,863, Cl. 264-177.110.
DeLiso, Evelyn M.; and Zaun, Kenneth E., 5,488,021, Cl. 502-63.000.
Deming, Scott W., 5,487,694, Cl. 451-49.000.
Gadkaree, Kishor P., 5,487,917, Cl. 427-228.000.
Gadkaree, Kishor P.; Patil, Mallanagouda D.; and Dawes, Steven B., 5,488,023, Cl. 502-182.000.
Hampton, Leslie E.; and Weiss, David S., 5,487,865, Cl. 419-5.000.
Rittler, Hermann L., 5,488,016, Cl. 501-39.000.

Correia, Yves: *See*—
Le Blevec, Jean-Marc; Correia, Yves; Masini, Jean-Jacques; Bousquet, Jacques; and Bergougnou, Maurice A., 5,488,190, Cl. 570-226.000.

Costa, Erminio; Guidotti, Alessandro; Baraldi, Mario; Bertolino, Mariella; DiBella, Maria; and Vicini, Stefano, to FIDIA - Georgetown Institute for the Neuro-Sciences. Method of treating learning and memory disorders using benzothiadiazide derivatives as nootropic agents. 5,488,049, Cl. 514-223.200.

Cotillion, Inc.: *See*—
D'Amore, William, Jr., 5,487,280, Cl. 63-12.000.

Cotrel, Yves P., to Sofamore Danek Group. Transverse fixation device for a spinal osteosynthesis system. 5,487,742, Cl. 606-61.000.

Cotton, John R., to Rank Brimar Limited. Deflection system. 5,488,272, Cl. 315-408.000.

Coulie, Pierre: *See*—
Boon-Falleur, Thierry; Brichard, Vincent; Van Pel, Aline; De Plaen, Etienne; Coulie, Pierre; Renauld, Jean-Christope; Wölfel, Thomas; and Lethé, Bernard, 5,487,974, Cl. 435-6.000.

Court, John J.: *See*—
Dunlap, Richard P.; Hlasta, Dennis J.; Desai, Ranjit C.; Latimer, Lee H.; Subramanyam, Chakrapani; Court, John J.; Bell, Malcolm R.; and Kumar, Virendra, 5,488,062, Cl. 514-373.000.

Covol Technologies, Inc.: *See*—
Ford, George W., Jr., 5,487,764, Cl. 44-553.000.

Cowan, Gloria L. Floor mopping device with wheeled support frame. 5,487,202, Cl. 15-228.000.

Cowell, Michael J.: *See*—
Anderson, Peter L.; Cowell, Michael J.; and Hotek, Dan J., 5,487,623, Cl. 405-286.000.

Cox, Charles E. Barrier device for a traffic bollard to protect detached movable objects during contact. 5,487,618, Cl. 404-6.000.

Cox, Charles P.: *See*—
Polson, Alan M.; Swanbom, Deryl D.; Dunn, Richard L.; Cox, Charles P.; Norton, Richard L.; Lowe, Bryan K.; and Peterson, Kenneth S., 5,487,897, Cl. 424-426.000.

Coyle, Laurie; Finucane, Kevin M.; Greene, Alan P.; and Moran, Robert E., to Lever Brothers Company, Division of Conopco, Inc. Process for accurately controlling moisture levels of aqueous surfactant compositions during on line processing. 5,487,843, Cl. 252-89.100.

Crafts, Harold S., to AT&T Global Information Solutions Company; Hyundai Electronics America; and Symbios Logic Inc. Differential analog transistors constructed from digital transistors. 5,488,249, Cl. 257-401.000.

Crane Plastics Company Limited Partnership: *See*—
Newby, Charles D., 5,487,937, Cl. 428-317.100.

Crane, Robert F.: *See*—
Wentworth, Steven W.; Crane, Robert F.; and Haas, Jon A., 5,487,430, Cl. 173-91.000.

Crawley, Dolph R.; and Brooke, Steven R., to Baker Hughes Incorporated. Mounting system for raise and shaft cutters. 5,487,435, Cl. 175-363.000.

Creamery Hollow U.S.A., Inc.: *See*—
Fackrell, Robert N.; and Griffeth, Lorenzo P., 5,487,913, Cl. 426-663.000.

Creatura, John A.: *See*—
Mahabadi, Hadi K.; Wright, Denise Y.; Cunningham, Michael F.; and Creatura, John A., 5,487,847, Cl. 252-511.000.

Creeke, Murray A.: *See*—
Robertson, Paul A.; Houzego, Peter J.; Jensen, Borge R.; Creeke, Murray A.; Emerton, Neil; Hodson, Peter D.; and Baum, Eric A., 5,487,378, Cl. 128-200.160.

Cregge, Robert J.: *See*—
Flynn, Gary A.; Cregge, Robert J.; Fevig, Thomas L.; Sunder, Shyam; and Shum, Patrick W., 5,488,048, Cl. 514-214.000.

Crippen, Randall M.: *See*—
Orrico, Mario M. V.; Olson, William J.; Zielinski, James S.; and Crippen, Randall M., 5,488,209, Cl. 200-61.700.

Cristobal, Cliff: *See*—
Radons, Stephen W.; King, Steven L.; Mills, Randall D.; and Cristobal, Cliff, 5,487,751, Cl. 607-1.000.

Croci, Tiziano: *See*—
Baroni, Marco; Cecchi, Roberto; and Croci, Tiziano, 5,488,151, Cl. 562-452.000.

Cronquist, Brian E.: *See*—
Quek, Elgin K. B.; Cronquist, Brian E.; and Wei, Che C., 5,488,244, Cl. 257-314.000.

Crossman, David D.: *See*—
Marshall, Jeremy; and Crossman, David D., 5,487,748, Cl. 606-182.000.

Crump, Druce K.: *See*—
Athey, Phillip S.; Crump, Druce K.; and Wilson, David A., 5,488,130, Cl. 558-441.000.

Crystal, Richard G.; Geffre, Raymond; and Karlsson, Sven, to Graphic Utilities, Inc. Method for refilling ink jet cartridges. 5,488,400, Cl. 347-85.000.

CTB, Inc.: *See*—
Hoover, Don R., 5,487,226, Cl. 34-503.000.

Cunningham, Earl A., to International Business Machines Corporation. Self adaptive head for semi-contact recording. 5,488,524, Cl. 360-103.000.

Cunningham, George M.; Frost, Rodney I.; and Lachman, Irwin M., to Corning Incorporated. Extrusion die for protrusion and/or high cell density ceramic honeycomb structures. 5,487,863, Cl. 264-177.110.

Cunningham, Michael F.: *See*—
Mahabadi, Hadi K.; Wright, Denise Y.; Cunningham, Michael F.; and Creatura, John A., 5,487,847, Cl. 252-511.000.

Curington, Alfred R., to Baker Hughes Incorporated. Slip release mechanism. 5,487,427, Cl. 166-382.000.

Curtis, Harold D., to Tower Tech, Inc. Dual layered drainage collection system. 5,487,531, Cl. 261-30.000.

Curtis, Harold D., to Tower Tech, Inc. Pultruded cooling tower construction. 5,487,849, Cl. 261-30.000.

Cutler, Christopher A.: *See*—
Smith, Steven R.; Cutler, Christopher A.; and Wallace, William D., 5,487,377, Cl. 600-204.000.

Cutter, Daniel F., to Data Translation, Inc. Video peripheral board in expansion slot independently exercising as bus master control over system bus in order to relief control of host computer. 5,488,695, Cl. 395-290.000.

Czanderna, Alvin W.: *See*—
King, David E.; Czanderna, Alvin W.; and Kennedy, Cheryl E., 5,487,792, Cl. 136-256.000.

Czernakowski, Waldemar: *See*—
Burleigh, David W.; Czernakowski, Waldemar; and Wetter, Hermann, 5,487,588, Cl. 297-253.000.

D.O.M. Associates Int'l.: *See*—
Fateley, William G.; and Sobczynski, Radoslaw, 5,488,474, Cl. 356-326.000.

Daewoo Electronics Co., Ltd.: *See*—
Kim, Jin Tae, 5,488,592, Cl. 369-13.000.

Daft, Christopher M. W.: *See*—
Engeler, William E.; and Daft, Christopher M. W., 5,488,588, Cl. 367-7.000.

Dahlin, Donald W.: *See*—
Hlousek, Louis; Odencrantz, K. C.; Oswald, Richard K.; Dahlin, Donald W.; Motaei, Saied; Siggins, Paul W.; Wong, Kenny; Smith, Ronald A.; and Scheinert, Philip M., 5,488,240, Cl. 250-231.160.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See*—
Kakishita, Osamu; Nishioka, Jun; Fujita, Takeshi; and Matsuo, Katsuaki, 5,487,947, Cl. 428-424.400.

Dai Nippon Printing Co., Ltd.: *See*—
Sakano, Shinichi; Aoki, Daigo; Utsumi, Minoru; Akada, Masanori; and Shimizu, Osamu, 5,488,601, Cl. 369-120.000.

Dai, Pei-Shing E.: *See*—
Knifton, John F.; Marquis, Edward T.; and Dai, Pei-Shing E., 5,488,178, Cl. 568-578.000.
Knifton, John F.; Marquis, Edward T.; and Dai, Pei-Shing E., 5,488,179, Cl. 568-578.000.

Daicel Chemical Industries, Ltd.: *See*—
Kanno, Tatsuya; and Fududa, Yutaka, 5,488,094, Cl. 528-199.000.

Dainippon Ink and Chemicals, Inc.: *See*—
Kossmehl, Gerhard; and Lundt, Bettina, 5,488,093, Cl. 528-193.000.

Dainippon Pharmaceutical Co., Ltd.: *See*—
Uno, Yoichiro; Takeno, Fumio; Yamatoya, Kazuhiko; and Ohtsu, Keiji, 5,488,105, Cl. 536-128.000.

Daishin Instrument Co., Ltd.: *See*—
Ohki, Sinji, 5,488,558, Cl. 364-449.000.

Daiwabo Create Co., Ltd.: *See*—
Ikkanzaka, Isao; Ikeda, Kazuhiro; and Takai, Yousuke, 5,487,944, Cl. 428-374.000.

Dallas Semiconductor Corporation: *See*—
Dias, Donald R.; and Mumper, Eric W., 5,488,284, Cl. 320-39.000.

Dalton, Patrick S.: *See*—
Dalton, William S.; Dalton, Patrick S.; and Clark, Richard S., 5,487,549, Cl. 277-54.000.

Dalton, William S.; Dalton, Patrick S.; and Clark, Richard S., to Demag Delaval Turbomachinery Corp. TurboCare Division. Turbine interfitting packing with cam adjustment. 5,487,549, Cl. 277-54.000.

Daly, Rita: *See*—
Daly, Thomas M.; and Daly, Rita, 5,487,548, Cl. 273-431.000.

Daly, Thomas M.; and Daly, Rita. Question and answer board game representing snooker. 5,487,548, Cl. 273-431.000.

D'Amore, Jean-François: *See*—
Laurain, Jean-Marie; DeWald, Ronald L.; D'Amore, Jean-François; and Deneuvillers, Guy, 5,487,743, Cl. 606-61.000.

D'Amore, William, Jr., to Cotillion, Inc. Convertible earring. 5,487,280, Cl. 63-12.000.

Dan-Chief Enterprise Co., Ltd.: *See—*
Liu, Danny, 5,488,201, Cl. 174-262.000.

Dana Corporation: *See—*
Brown, Johnny M., 5,487,767, Cl. 55-357.000.

Danielson, Arvin D.; Schultz, Darald R.; Silva, Dennis; Boatwright, Darrell L.; Austin, Rickey G.; and Alt, Daniel E., to Norand Corporation. Portable work station and data collection terminal including switchable multi purpose touch screen display. 5,488,575, Cl. 364-707.000.

Danishefsky, Samuel J.; Bornmann, William G.; Queneau, Yves; Magee, Thomas V.; Krol, Walter J.; Masters, John J.; and Jung, David K., to Sloan-Kettering Institute for Cancer Research. Total synthesis of taxol and analogues thereof. 5,488,116, Cl. 549-214.000.

Dao, Loc H.: *See—*
Ramachandran, Ramakrishnan; and Dao, Loc H., 5,488,185, Cl. 568-896.000.

Daoud, Bassel Hage, to AT&T Corp. Integrated protector and modular jack. 5,487,675, Cl. 439-95.000.

Daoust, Bernard, to Canstar Sports Group Inc. Braking mechanism for in-line skates. 5,487,552, Cl. 280-11.200.

Dapec, Inc.: *See—*
Dillard, Kenneth D., 5,487,700, Cl. 452-188.000.

Dapper, Gregory S.; and Yamamoto, Ronald K., to Vitaphore Corporation. Method for forming controlled release polymeric substrate. 5,487,895, Cl. 424-278.100.

Dassault Electronique: *See—*
Chazelle, Xavier; Hunot, Anne-Marie; and Lepere, Gérard, 5,488,563, Cl. 364-461.000.

Data Translation, Inc.: *See—*
Cutter, Daniel F., 5,488,695, Cl. 395-290.000.

DataSouth Computer Corporation: *See—*
Uland, David M., 5,487,337, Cl. 101-288.000.

Daum, Ulrich: *See—*
Hardt, Peter; Daum, Ulrich; and Völker, Theodor, 5,488,163, Cl. 564-315.000.

David Sarnoff Research Center, Inc.: *See—*
Burt, Peter J.; van der Wal, Gooitzen S.; Kolczynski, Raymond J.; and Hingorani, Rajesh, 5,488,674, Cl. 382-284.000.
Hanna, Keith J., 5,488,675, Cl. 382-284.000.

Davidson Textron Inc.: *See—*
Ash, Robert A., 5,487,800, Cl. 156-87.000.

Davis, Donald E.: *See—*
Zampini, Michael A.; Flum, Alan; Davis, Donald E.; and Dombrowski, Joseph J., 5,488,669, Cl. 381-119.000.

Davis, L. Berkley, Jr.: *See—*
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Marcadis, Stuart J.; and Devries, James H., 5,487,730, Cl. 604-96.000.

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Falgén, Helena; Sundström, Göran; Landfors, Johan; and Sokol, John C., 5,487,881, Cl. 423-478.000.
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Korall, Menachem; Harats, Yehuda; Dechovich, Boris; Goldstein, Jonathan R.; and Koretz, Binyamin, 5,487,955, Cl. 429-26.000.
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Nathenson, Richard D.; Apt, Jerome, Jr.; Uram, Martin J.; Brumbaugh, Paul M.; Brawley, Gary H.; Hackman, Donald J.; and Christenson, Brian, 5,487,229, Cl. 37-347.000.
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Le Blevec, Jean-Marc; Correia, Yves; Masini, Jean-Jacques; Bousquet, Jacques; and Bergougnou, Maurice A., 5,488,190, Cl. 570-226.000.

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Bodick, Neil C.; Bymaster, Franklin P.; Offen, Walter W.; and Shannon, Harlan E., 5,488,056, Cl. 514-305.000.
Palkowitz, Alan D., 5,488,058, Cl. 514-324.000.
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Ellis, Frank B., Jr. Formation of tin oxide films on glass substrates. 5,487,784, Cl. 118-718.000.

Elmer, Werner, to Texas Instruments Deutschland GmbH. Circuit arrangement integrated in a semiconductor circuit. 5,488,288, Cl. 323-284.000.

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Elschner, Andreas: *See*—
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Emambakhsh, Al S., to TRW Vehicle Safety Systems Inc. Apparatus for controlling flow of inflation fluid into an air bag. 5,487,560, Cl. 280-740.000.

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Hult, David R.; Young, Jeffery L.; and Holsten, Stuart V., 5,487,213, Cl. 29-596.000.
Rau, C. Peter; and Hitch, Thomas T., 5,488,534, Cl. 361-56.000.
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Emery, Mark V.: *See*—
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Encore Technologies, Inc.: *See*—
Osborn, John D., 5,488,080, Cl. 524-270.000.

Endo, Kiyonobu; Matsumoto, Kazuya; and Kuwayama, Tetsuro, to Canon Kabushiki Kaisha. Optical pickup using split beams impinging on different photodetector areas. 5,488,598, Cl. 369-120.000.

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Energy Innovations, Inc.: *See*—
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Energy Life Systems Corporation: *See*—
Sulek, Stanislaw; and Hussein, Hany M. G., 5,487,740, Cl. 606-15.000.

Engeler, William E.; and Daft, Christopher M. W., to General Electric Company. Ultrasonic imager having wide-bandwidth dynamic focusing. 5,488,588, Cl. 367-7.000.

Engelhardt, Fritz; Kühlwein, Jürgen; Schuler, Wilfried; Zerrer, Ralf; and Antwerpen, Werner, to Cassella AG. Polycondensates containing polysiloxane groups. 5,488,123, Cl. 556-428.000.

Engle, Craig D. Enhanced electrostatic shutter mosaic modulator. 5,488,505, Cl. 359-292.000.

Engst, Wilhelm; Repczuk, Alexander; and Weller, Horst, to Clouth Gummiwerke Aktiengesellschaft. Shock absorber component for railway track having pourous rubber particle core enclosed by cover layer. 5,487,501, Cl. 238-2.000.

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Keane, Anthony R. A.; and Vandebroek, Bart C., 5,488,331, Cl. 330-296.000.

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Messina, Giuseppe; Sechi, Giovanni M.; and De Micheli, Silvio, 5,488,158, Cl. 564-125.000.

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Enterra Patco Oilfield Products Inc.: *See*—
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Isanhart, Bowdie J., 5,487,457, Cl. 192-58.200.

EP Technologies, Inc.: *See*—
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Erowa AG: *See*—
Obrist, Basil, 5,487,539, Cl. 269-309.000.

Esch, Hans-Joachim: *See*—
Batzill, Manfred; Esch, Hans-Joachim; Mezger, Hans; Distelrath, Winfried; and Reustle, Albrecht, 5,487,363, Cl. 123-41.740.

Esdaile, Anthony R.: *See*—
Walkingshaw, M. Jay; Somerville, Lorne R.; Esdaile, Anthony R.; and Stuart, David J., 5,488,423, Cl. 348-460.000.

Essig, Willi: *See*—
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Essilor International: *See*—
Harsigny, Christian; Miege, Christian; Chauveau, Jean-Pierre; and Ahsbahs, Françoise, 5,488,442, Cl. 351-169.000.

Estes, David W., to CODEV Corp. Product dispenser with air displacement device. 5,487,490, Cl. 222-1.000.

Esumi, Kunio: *See*—
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Ethicon Endo-Surgery, Inc.: *See*—
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Demarest, David; Duncan, Robert B.; Sobel, Martin; Lenihan, Timothy P.; Rattan, William; Blanch, John F.; Hodulik, Michael G.; and Yost, Dennis P., 5,487,212, Cl. 29-407.000.
Demarest, David; and Hodulik, Michael G., 5,487,216, Cl. 29-705.000.
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ETI Systems: *See*—
Tice, Bill, 5,488,275, Cl. 318-468.000.

Eulmi, Sam H.: *See*—
Cole, Michael L., 5,488,364, Cl. 341-50.000.

Evans, Christopher M.; and Norman, Colin F. W., to Minnesota Mining and Manufacturing Company. Magnetic recording medium with a binder resin of a starblock copolymer having at least six arms. 5,487,951, Cl. 428-523.000.

Evans, Jonathan C.; Goralski, Christian T.; Rand, Cynthia L.; and Vosejpka, Paul C., to Merrell Dow Pharmaceuticals Inc. Process for the preparation of (E)-1-amino-2-(fluoromethylene)-4-(p-fluorophenyl)butane, novel processes for preparing an intermediate thereof, and novel intermediates thereof. 5,488,188, Cl. 570-128.000.

Eveready Battery Company, Inc.: *See*—
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Everett, Peter K. Production of metals from minerals. 5,487,819, Cl. 205-347.000.

Everman, Michael R.; Murphy, David M.; and Wachholz, James J., to AEC Able Engineering Co., Inc. Stowable and self-deployable parallelogram-type panel array. 5,487,791, Cl. 136-245.000.

Everson, Mark P.: *See*—
Gerlock, John L.; and Everson, Mark P., 5,487,914, Cl. 427-140.000.

Evrard, Deborah A.: *See*—
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Excimer Laser Systems, Inc.: *See*—
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Exxon Chemical Patents Inc.: *See*—
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Shutt, John R.; and Touzard, Benoit M. F., 5,488,078, Cl. 524-71.000.

Eybergen, William N.; and Hutchison, Wayne K., to Eaton Corporation. Heat exchanger with integral filter/drier cartridge. 5,487,279, Cl. 62-474.000.

Eychenne, Yves: *See*—
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Fabio, Paul: *See*—
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Fabritex S.R.L.: *See*—
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Fackrell, Robert N.; and Griffeth, Lorenzo P., to Creamery Hollow U.S.A., Inc. Butter products. 5,487,913, Cl. 426-663.000.

FAG Kugelfischer Georg Schafer AG: *See*—
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Fagan, John E.; Sluss, James J., Jr.; Hassell, John W.; Mears, R. Brian; Beason, Ronnie B.; Wilkinson, Sonja R.; Lear, Tommy; and Tan, Kok S., to Gas Research Institute. System for characterizing flow pattern, pressure and movement of a fluid. 5,488,224, Cl. 250-227.160.

Failli, Amedeo A.; Bleyman, Oleg J.; Kao, Wenling; and Abou-Charbia, Magid A., to American Home Products Corporation. Carbamates of Rapamycin. 5,488,054, Cl. 514-291.000.

Fairbanks, Floyd B.; Snell, Thomas G.; and McDonough, James M., to BIC Corporation. Selectively actuatable lighter. 5,487,657, Cl. 431-153.000.

Fairbrother, Matthew D.: *See*—
Salsburg, Fredric S.; and Fairbrother, Matthew D., 5,487,638, Cl. 414-796.900.

Fairchild, Gary. Combination level. 5,487,222, Cl. 33-273.000.

Falgén, Helena; Sundström, Göran; Landfors, Johan; and Sokol, John C., to EKA Nobel Inc. Process of producing chlorine dioxide. 5,487,881, Cl. 423-478.000.

Falke, Peter; Seifert, Holger; and Heinz, Marion, to BASF Schwarzheide GmbH. Polyurethane-based, compact moldings or moldings having a cellular core and a compacted surface, process for their production, and their use as shoe or shoe sole material. 5,488,070, Cl. 521-51.000.
Fall, David J.; and Guerra, Miguel A., to Minnesota Mining and Manufacturing Company. Fluorination in tubular reactor system. 5,488,142, Cl. 560-227.000.
Fanuc Ltd.: *See*—
Suzuki, Ryuji, 5,487,628, Cl. 409-135.000.
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Heimendinger, Bernard, 5,487,474, Cl. 211-59.200.
Faraj, Mahmoud K., to Arco Chemical Technology. Preparation of dialkyl peroxides. 5,488,176, Cl. 568-558.000.
Faris, Randi W.; and Henz, Christopher, to Motorola, Inc. Method and apparatus for setting a memory full condition in a selective call receiver. 5,488,359, Cl. 340-825.440.
Farmitalia Carlo Erba S.r.l.: *See*—
Buzzetti, Franco; Longo, Antonio; and Colombo, Maristella, 5,488,057, Cl. 514-312.000.
Farmont, Johann, to Farmont Tecknik GmbH & Co. KG. Collection and issuing apparatus for round parking cards. 5,487,459, Cl. 194-213.000.
Farmont Tecknik GmbH & Co. KG: *See*—
Farmont, Johann, 5,487,459, Cl. 194-213.000.
Farnworth, Warren M., to Micron Technology, Inc. Method for fabricating a penetration limited contact having a rough textured surface. 5,487,999, Cl. 437-7.000.
Faroudja, Yves C.; and Bialo, Charles A., to Faroudja, Yves C. Video scan converter including the modification of spatially interpolated pixels as a function of temporal detail and motion. 5,488,422, Cl. 348-448.000.
Farrel Corporation: *See*—
Valsamis, Lefteris N.; Canedo, Eduardo L.; Pereira, Jose M.; and Poscich, Douglas V., 5,487,602, Cl. 366-81.000.
Farrell, Robert L.: *See*—
MacWilliams, Peter D.; Avni, Dror; Liebermensch, Avi; Baransy, Anan; and Farrell, Robert L., 5,488,639, Cl. 375-355.000.
Farwell, William D., to Hughes Aircraft Company. Method of testing the output propagation delay of digital devices. 5,488,309, Cl. 324-617.000.
Farwer, Alfward, to Messer Griesheim GmbH. Protective gas for the laser welding of aluminum. 5,488,216, Cl. 219-121.640.
Fateley, William G.; and Sobczynski, Radoslaw, to D.O.M. Associates Int'l. Hadamard phasing in a multisource array. 5,488,474, Cl. 356-326.000.
Favot, Jean-Jacques; Fontan, Jean-Pierre; and Perbet, Jean-Noël, to Sextant Avionique. Method and device for the optimizing of the performance characteristics of a liquid crystal display matrix screen as a function of the angle of observation. 5,488,391, Cl. 345-156.000.
Fazioli, Francesca: *See*—
DiFiore, Pier P.; and Fazioli, Francesca, 5,487,979, Cl. 435-240.200.
Federalloy, Inc.: *See*—
Singh, Akhileshwar R., 5,487,867, Cl. 420-471.000.
Feigel, Hans-Jörg, to ITT Automotive Europe GmbH. Variable flow valve with position sensor. 5,487,455, Cl. 188-299.000.
Feldle, Heinz-Peter: *See*—
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Felis, Kenneth P.: *See*—
Annacone, William R.; Felis, Kenneth P.; and Speliotis, Dennis E., 5,487,931, Cl. 428-64.100.
Fenzi, Neal O.; and Long, Stephen I., to Superconductor Technolgies Inc. Low noise amplifier. 5,488,382, Cl. 343-700.00R.
Fernandez, Joseph M.: *See*—
Herrnstadt, Corinna; Fernandez, Joseph M.; Smith, Lloyd; and Mead, David A., 5,487,993, Cl. 435-172.300.
Ferrari, Carlo, to Weider Health and Fitness, Inc. Exercise machine with enclosed resistance assembly. 5,487,714, Cl. 482-123.000.
Ferree, Marsha E.; and Gray, James P., to International Business Machines Corporation. System for establishing and performing multiple conversations simultaneously between transaction programs through logical units. 5,488,703, Cl. 395-200.120.
Ferry, Julian J.: *See*—
Miller, Mitchell E.; Ferry, Julian J.; Kilbey, Brian E.; Coolbear, Bruce S.; and Gandy, Richard F., 5,487,682, Cl. 439-607.000.
Fertin Laboratories Ltd. (Dansk Tyggegummi Fabrik A/S): *See*—
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Fessler, John T.: *See*—
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Stoll, Kurt; de Fries, Jan R.; and Köngeter, Herbert, 5,487,409, Cl. 137-625.640.
Fettig, Guenter; Horn, Juergen; Bogdanski, Franz; and Essig, Willi, to E.G.O. Elektro-Gerate Blanc u. Fischer. Inductive cooking point heating system. 5,488,214, Cl. 219-627.000.
Fevig, Thomas L.: *See*—
Flynn, Gary A.; Cregge, Robert J.; Fevig, Thomas L.; Sunder, Shyam; and Shum, Patrick W., 5,488,048, Cl. 514-214.000.
Ficker, Stefan, to Ingenieurburo S. Ficker Verfahrenstechnik. Apparatus for preparing rubber scrap for recycling. 5,487,510, Cl. 241-199.600.
FIDIA - Georgetown Institute for the Neuro-Sciences: *See*—
Costa, Erminio; Guidotti, Alessandro; Baraldi, Mario; Bertolino, Marilella; DiBella, Maria; and Vicini, Stefano, 5,488,049, Cl. 514-223.200.
Fidziukiewicz, Erich D.: *See*—
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Fife, James F.; Vorhis, Daniel J.; Laughlen, Kenneth D.; and Dienes, Nancy L., to Mountain Safety Research (MSR). Water filter with adjustable inlet hose assembly. 5,487,833, Cl. 210-232.000.
Figura, Thomas A.; and Prall, Kirk D., to Micron Technology, Inc. Method of forming contact areas between vertical conductors. 5,488,011, Cl. 437-60.000.
Fileco: *See*—
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Findlay, David: *See*—
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Finet, Philip J.; and Kirkham, Edward, to Giddings & Lewis. Rotational motion limit detector system and method. 5,487,315, Cl. 73-865.900.
Finkenzeller, Ulrich: *See*—
Reiffenrath, Volker; Kurmeier, Hans A.; Poetsch, Eike; Plach, Herbert; Finkenzeller, Ulrich; Bartmann, Ekkehard; Krause, Joachim; and Scheuble, Bernhard, 5,487,845, Cl. 252-299.630.
Finn-Aqua Santasalo-Sohlberg Oy: *See*—
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Finucane, Kevin M.: *See*—
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Firoozmand, Farzin, to Advanced Micro Devices, Inc. Network controller with memory request and acknowledgement signals and a network adapter therewith. 5,488,724, Cl. 395-200.070.
Fischer, Eugene: *See*—
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Fischer, Gerhard: *See*—
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Fischer, Kenneth E. Electronic avoidance configurations. 5,488,372, Cl. 342-5.000.
Fischer, Thomas: *See*—
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Fischer, Walter: *See*—
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Fischer-Reimann, Evelyn; and Fischer, Walter, to Ciba-Geigy Corporation. Polymerisable photochromic naphthacenediones, polymers of these monomers, process for their preparation and the use thereof. 5,488,119, Cl. 552-201.000.
Fisher Controls International, Inc.: *See*—
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Fisher, Jacob E., Jr.: *See*—
Yount, Patty L.; and Fisher, Jacob E., Jr., 5,487,250, Cl. 52-417.000.
Fisher, Raymond, to Eastman Chemical Company. Process for the preparation of 1-hydroxyindole compounds. 5,488,113, Cl. 548-508.000.
Fisher, Richard J.: *See*—
Hewitt, Kent D.; Alexander, Samuel E.; and Fisher, Richard J., 5,488,711, Cl. 395-430.000.
Fissler, Harald, to Vesta AG & Co. OHG. Cooking or boiling pot. 5,487,329, Cl. 99-403.000.
Fitzsimmons, George W.: *See*—
Harvey, Donn T.; and Fitzsimmons, George W., 5,488,380, Cl. 342-368.000.
Fizet, Christian, to Hoffmann-La Roche Inc. Process for tocopherols and sterols from natural sources. 5,487,817, Cl. 203-38.000.
Flammer, George H., III, to Metricom, Inc. Method and system for routing packets in a packet communication network using locally constructed routing tables. 5,488,608, Cl. 370-85.130.
Fleck, Friedrich; and Jörgens, Klaus-Dieter, to Siemens Aktiengesellschaft. Optical character generator for an electro photographic printer. 5,488,404, Cl. 347-238.000.
Fleetwood Systems, Inc.: *See*—
Mojden, Andrew E.; and Hoinacki, Richard P., 5,487,637, Cl. 414-788.400.
Floryan, Richard F.; and Frisch, David D., to ITT Corporation. High throughput assembly station and method for image intensifier tubes. 5,487,689, Cl. 445-29.000.
Floyd, Thomas R.: *See*—
Rivera, David F.; Floyd, Thomas R.; and Josypenko, Michael J., 5,488,336, Cl. 333-252.000.
Fluidmaster, Inc.: *See*—
Hennessy, Arnold, 5,487,193, Cl. 4-328.000.
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Fujimoto, Jun, to NEC Corporation. Fiber reinforced composite material and a process for the production thereof. 5,487,928, Cl. 428-36.400.
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Fujitsu Network Engineering Limited: *See*—
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G & W Electric Company: *See*—
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G. D. Searle & Co.: *See*—
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Chrusciel, Robert A.; Hagen, Timothy J.; Hallinan, E. Ann; Li, Jinglin; Tsymbalov, Sofya; and Reitz, David B., 5,488,046, Cl. 514-211.000.
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Gandy, Richard F.: *See*—
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Gardiner, David V.: *See*—
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Gastorf, Robert J.: *See*—
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Genentech, Inc.: *See*—
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General Electric Company: *See—*
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Chennakeshu, Sandeep; Koilpillai, Ravinder D.; and Toy, Raymond L., 5,488,635, Cl. 375-340.000.
El-Hamamsy, Sayed-Amr; Kheraluwala, Mustansir H.; and Kachmarik, David J., 5,488,269, Cl. 315-307.000.
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Rajamani, Ravi; Minto, Karl D.; Bulkley, Benjamin E.; and Norman, Bruce G., 5,487,265, Cl. 60-39.030.
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General Hospital Corporation, The: *See—*
Smith, John A.; Lee, Fang-Jen S.; and Lin, Lee-Wen, 5,487,990, Cl. 435-172.300.
General Signal Corporation: *See—*
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Genzyme Corporation: *See—*
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Geotechnical Instruments (UK) Limited: *See—*
Sweet, Christopher R., 5,488,227, Cl. 250-343.000.
Gerber, Hans, to Garaventa Holding A.G. Braking apparatus and method for a rail-bound carriage of an inclined or vertical elevator. 5,487,450, Cl. 187-367.000.
Gerber, Howard L., to Inland Steel Company. Strip casting apparatus with electromagnetic confining dam. 5,487,421, Cl. 164-467.000.
Gerber, Matthias: *See—*
Hamprecht, Gerhard; Mayer, Horst; Westphalen, Karl-Otto; Gerber, Matthias; Kardorff, Uwe; and Walter, Helmut, 5,488,029, Cl. 504-212.000.
Gerhart, Roland T.; and Fidziukiewicz, Erich D., to Connell Limited Partnership. Univers cam unit. 5,487,296, Cl. 72-381.000.
Gerlach, Peter: *See—*
von Ammon, Wilfried; Dornberger, Erich; Oelkrug, Hans; Gerlach, Peter; and Segieth, Franz, 5,487,354, Cl. 117-13.000.
Gerlock, John L.; and Everson, Mark P., to Ford Motor Company. Method of adding UV light absorbers into polymeric substrates. 5,487,914, Cl. 427-140.000.
Gerstenberg, Uwe: *See—*
Ball, Johannes; Henseler, Wolfgang; Gerstenberg, Uwe; and Fischer, Thomas, 5,487,558, Cl. 280-728.300.
Gezima, Makoto: *See—*
Kawamoto, Takato; Gezima, Makoto; and Furuse, Eiichi, 5,488,279, Cl. 318-801.000.
Gharachorloo, Nader; and Luken, William L., to International Business Machines Corporation. Method and apparatus for rendering trimmed parametric surfaces. 5,488,684, Cl. 395-123.000.
Glaser Tool Co.: *See—*
Tibbet, Michael D., 5,487,538, Cl. 269-71.000.
Gibboney, James W., Jr., to Scientific Products Corporation. Air intake system for an internal combustion engine. 5,487,874, Cl. 422-186.030.
Gibson, Kerr: *See—*
Gibson, Seann; and Gibson, Kerr, 5,488,717, Cl. 395-600.000.
Gibson, Seann; and Gibson, Kerr, to 1st Desk Systems, Inc. MTree data structure for storage, indexing and retrieval of information. 5,488,717, Cl. 395-600.000.
Giddings & Lewis: *See—*
Finet, Philip J.; and Kirkham, Edward, 5,487,315, Cl. 73-865.900.
Giessler, Josef: *See—*
Von Holst, Peder; and Giessler, Josef, 5,487,626, Cl. 408-144.000.
Gilchrist, George W.: *See—*
Bartilucci, Anthony R.; Gilchrist, George W.; and Yurman, Richard, 5,487,864, Cl. 264-219.000.
Giler, Eric R.; and Duehren, David W., to Brooktrout Technology, Inc. Fax message system. 5,488,651, Cl. 379-100.000.
Giles, Oley: *See—*
Salant, Richard F.; Green, Itzhak; Hufford, Larry A.; and Giles, Oley, 5,487,550, Cl. 277-65.000.
Gille, Denis: *See—*
Thevenet, Bruno; and Gille, Denis, 5,487,804, Cl. 156-148.000.
Gillette Company, The: *See—*
Lyon, Sue B.; O'Neal, Clifford; Van Der Lee, Hermes; and Rogers, Brian, 5,487,886, Cl. 424-65.000.
Gillham, Robert W.: *See—*
Cherry, John A.; Vales, Enoch S.; and Gillham, Robert W., 5,487,622, Cl. 405-128.000.
Gilmore, Phillip J., to Rapistan Demag Corporation. Extendable conveyor without base unit. 5,487,462, Cl. 198-594.000.
Giugni, Fabrizio: *See—*
Micheloni, Walter; Giugni, Fabrizio; and Ahlbaumer, Georg, 5,487,188, Cl. 2-16.000.
Glance, Bernard, to AT&T Corp. Tunable add drop optical filtering method and apparatus. 5,488,500, Cl. 359-127.000.
Glass, Jeffrey T.; Simendinger, Denise T.; and Goeller, Peter T., to North Carolina State University. Oriented diamond film structures on non-diamond substrates. 5,488,232, Cl. 257-77.000.
Glass, Jeffrey T.: *See—*
Yang, Peichun; Zhu, Wei; and Glass, Jeffrey T., 5,487,945, Cl. 428-408.000.
Glassner, Andrew, to Xerox Corporation. Image rendering system with local, adaptive estimation of incident diffuse energy. 5,488,700, Cl. 395-126.000.
Gleason, Dana W. Sporting pack with apparatus for concentrating weight of pack at lumbar region of wearer. 5,487,498, Cl. 224-224.000.
Gledhill, Jeffrey J.: *See—*
Mason, Arthur G.; and Gledhill, Jeffrey J., 5,488,632, Cl. 375-260.000.
Gleim, Günter, to Deutsche Thomson-Brandt GmbH. Deflection regulating method and device. 5,488,271, Cl. 315-370.000.
Globe-Union, Inc.: *See—*
Dougherty, Thomas J.; Wruck, William J.; and Johnson, Richard J., 5,488,283, Cl. 320-15.000.
Glode, Leonard M.: *See—*
Nett, Torrance M.; and Glode, Leonard M., 5,488,036, Cl. 514-15.000.
Gnade, Bruce E.: *See—*
Havemann, Robert H.; Jeng, Shin-Puu; Gnade, Bruce E.; and Cho, Chih-Chen, 5,488,015, Cl. 437-195.000.
GNB Battery Technologies, Inc.: *See—*
Benson, Cory D., 5,487,496, Cl. 222-593.000.
Gnyp, Steven M.: *See—*
Brennan, Thomas J.; DeFillipi, Michael E.; Gnyp, Steven M.; and Kremer, Gregory D., 5,487,781, Cl. 118-300.000.
Go, Shintetsu; Kashizaki, Yoshio; Suzuki, Koichi; Sato, Kazuma; and Shimada, Akira, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member and electrophotographic apparatus using the same. 5,488,461, Cl. 355-211.000.
Gober, Glenn D. Support apparatus for fencing. 5,487,235, Cl. 47-46.000.
Goddard, Moses: *See—*
Aebischer, Patrick; Goddard, Moses; Moldauer, John G.; Mulhauser, Paul J.; Rathbun, Anne M.; Sanberg, Paul R.; Vasconcellos, Alfred V.; and Warner, Nicholas F., 5,487,739, Cl. 604-890.100.
Godlove, Ronald E.; Jordan, Venita A.; McCumiskey, Robert E.; Yuh, Huoy-Jen; and Zaman, Kamran U., to Xerox Corporation. Electrostatographic imaging member assembly. 5,488,460, Cl. 355-211.000.
Goeller, Peter T.: *See—*
Glass, Jeffrey T.; Simendinger, Denise T.; and Goeller, Peter T., 5,488,232, Cl. 257-77.000.
Goet, Richard C. Filtration apparatus with exchangeable filters. 5,487,828, Cl. 210-90.000.
Goggins, Timothy P., to National Graphics, Inc. Method of producing multidimensional lithographic separations free of moire interference. 5,488,451, Cl. 355-77.000.
Gold, Kenneth S.; and France, Hubert M., Jr., to Radio Connect Corporation. Wireless direct-sequence spread spectrum TDMA communications system. 5,488,631, Cl. 375-206.000.
Goldstar Co., Ltd.: *See—*
Cho, Won S., 5,488,690, Cl. 395-109.000.
Hong, Sung H., 5,488,430, Cl. 348-699.000.
Kim, Jung H.; Chung, Hae Y.; Kim, Hyung S.; Lee, Byeong H.; and Roh, Young H., 5,487,284, Cl. 68-3.0SS.
Lee, Byung C., 5,487,653, Cl. 418-14.000.
Pack, Bok H., 5,488,426, Cl. 348-569.000.
Goldstar Electron Co., Ltd.: *See—*
Jung, Hun J., 5,488,239, Cl. 257-231.000.
Goldstein, Jonathan R.: *See—*
Korall, Menachem; Harats, Yehuda; Dechovich, Boris; Goldstein, Jonathan R.; and Koretz, Binyamin, 5,487,955, Cl. 429-26.000.
Golin, Stuart: *See—*
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Gomi, Shuichi: *See—*
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Gomibuchi, Reizo, to Nippon Sanmo Sensyoku Co., Ltd. Carboxyl group-modified acrylonitrile fiber and process of producing same. 5,487,942, Cl. 428-364.000.
Goncalves, Joseph E. F., to Ipex Inc. Liner pipe for repair of a host pipe. 5,487,411, Cl. 138-98.000.
Gonzales, David R.; and Carichner, Gordon A., to Motorola, Inc. Data processor with real-time diagnostic capability. 5,488,688, Cl. 395-183.100.
Gonzalez, Michael A.: *See—*

Olmstead, Thomas A.; Gonzalez, Michael A.; Orvik, Jon A.; Pearson, Douglas L.; Ringer, James W.; Shiang, Dawn; Tai, Jimmy J.; and Wallin, Anne P., 5,488,109, Cl. 544-263.000.

Good, Jackson J. Orthodontic apparatus. 5,487,660, Cl. 433-3.000.

Good, Jef W.: *See—*
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Goodrick, Jason C.: *See—*
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Goodyear Tire & Rubber Company, The: *See—*
Sandstrom, Paul H., 5,488,077, Cl. 523-438.000.

Goralski, Christian T.: *See—*
Evans, Jonathan C.; Goralski, Christian T.; Rand, Cynthia L.; and Vosejpka, Paul C., 5,488,188, Cl. 570-128.000.

Gore, Brian J.: *See—*
Greco, Robert C.; and Gore, Brian J., 5,488,650, Cl. 379-67.000.

Gorrell, David G.: *See—*
Gorrell, James E.; and Gorrell, David G., 5,487,241, Cl. 52-79.100.

Gorrell, James E.; and Gorrell, David G. Wind resistant building system. 5,487,241, Cl. 52-79.100.

Goto, Fumio: *See—*
Ozaki, Takahiro; Munakata, Tomoo; Goto, Fumio; and Tsuchiya, Tetsuo, 5,487,837, Cl. 252-25.000.

Gottfried Joos Maschinenfabrik GmbH & Co.: *See—*
Handke, Gerald, 5,487,332, Cl. 100-93.00P.

Gottorff, Richard L.: *See—*
Panek, John G.; and Gottorff, Richard L., 5,487,573, Cl. 285-332.000.

Goulait, David J. K.; and Cabell, David W., to Procter & Gamble Company, The. Method for manufacturing tape tab stock that may be used to produce tape tab fasteners for disposable absorbent articles. 5,487,809, Cl. 156-259.000.

Gould Electronics, Ltd.: *See—*
Miller, Allen, 5,488,369, Cl. 341-122.000.

Goulet, Douglas P., to IMI Cornelius Inc. Ice cooled beverage dispenser having an integral carbonator. 5,487,492, Cl. 222-129.100.

Gourdine, Meredith, to Energy Innovations, Inc. Method and apparatus for converting chemical and thermal energy into electricity. 5,487,957, Cl. 429-49.000.

Gourse, Stanley J.; Fischer, Eugene; and Harrison, George A., to Litton Systems, Inc. Test probe and circuit board arrangement for the circuit under test for microstrip circuitry. 5,488,313, Cl. 324-754.000.

Gove, Robert J.; Doherty, Donald B.; Heimbuch, Scott D.; Urbanus, Paul M.; and Marshall, Stephen W., to Texas Instruments Incorporated. Video data formatter for a multi-channel digital television system without overlap. 5,488,431, Cl. 348-716.000.

Gowan, Mary K.: *See—*
Brown, John F., III; and Gowan, Mary K., 5,488,730, Cl. 395-800.000.

Grabenkort, Richard W., to Abbott Laboratories. Exhaled gas filter and cooler. 5,487,380, Cl. 128-204.150.

Grabowski, David N., to Chivas Products Limited. Retractable beverage container holder. 5,487,519, Cl. 248-311.200.

Graham-Meighan, Margaret: *See—*
Hedayatnia, Mostafa; and Graham-Meighan, Margaret, 5,488,351, Cl. 340-407.100.

Graiver, Daniel: *See—*
Cabasso, Israel; and Graiver, Daniel, 5,488,087, Cl. 525-100.000.

Grammer AG: *See—*
Meiller, Hermann; and Beier, Wolfgang, 5,487,589, Cl. 297-342.000.

Grana, Thomas A.: *See—*
Potts, Jeffrey R.; Lindenman, Charles E.; and Grana, Thomas A., 5,487,593, Cl. 303-11.000.

Graphic Utilities, Inc.: *See—*
Crystal, Richard G.; Geffre, Raymond; and Karlsson, Sven, 5,488,400, Cl. 347-85.000.

Grate, Anton. Attraction board for retaining an enlarged figure panel thereon. 5,487,231, Cl. 40-618.000.

Gray, James P.: *See—*
Ferree, Marsha E.; and Gray, James P., 5,488,703, Cl. 395-200.120.

Grdina, David J., to Arch Development Corporation. Method for protection against genotoxic mutagenesis. 5,488,042, Cl. 514-114.000.

Greco, Robert C.; and Gore, Brian J., to Active Voice Corporation. Configurable telephone interface for electronic devices. 5,488,650, Cl. 379-67.000.

Green, Itzhak: *See—*
Salant, Richard F.; Green, Itzhak; Hufford, Larry A.; and Giles, Oley, 5,487,550, Cl. 277-65.000.

Green, Thomas W., to Acme Electric Corporation. Low-loss clamp circuit. 5,488,554, Cl. 363-25.000.

Green, Todd J., to BASF Corporation. Rigid closed cell polyisocyanate based foams for use as positive flotation materials in watercraft. 5,488,072, Cl. 521-129.000.

Greene, Alan P.: *See—*
Coyle, Laurie; Finucane, Kevin M.; Greene, Alan P.; and Moran, Robert E., 5,487,843, Cl. 252-89.100.

Greenhalgh Technologies: *See—*
Greenhalgh, William H., 5,488,666, Cl. 381-71.000.

Greenhalgh, William H., to Greenhalgh Technologies. System for suppressing sound from a flame. 5,488,666, Cl. 381-71.000.

Greer, Jeffrey P.: *See—*
Back, Gordon E.; and Greer, Jeffrey P., 5,487,826, Cl. 206-308.300.

Griego, Thomas P., to Uemura Kogyo Kabushiki Kaisha. Electroplating apparatus and electroplating method of small articles. 5,487,824, Cl. 205-128.000.

Griepentrog, Dal F., to Thomson Consumer Electronics, Inc. Automatic kinescope bias control system. 5,488,417, Cl. 348-379.000.

Grieshaber & Co. AG Schaffhausen: *See—*
Stagmann, Robert; and Demmerle, Rudolf, 5,487,747, Cl. 606-166.000.

Griffeth, Lorenzo P.: *See—*
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Griffin, Brenda G. Container for earrings and small jewelry. 5,487,600, Cl. 312-135.000.

Griffin, Nigel D., to Camco Drilling Group Limited. Cutter assemblies for rotary drill bits. 5,487,436, Cl. 175-432.000.

Grimes Aerospace Company: *See—*
Scherch, Richard P.; and Neer, Robert E., 5,487,205, Cl. 15-250.310.

Grimes, Gary J., to AT&T Corp. Apparatus for storing video information by recognizing video frames. 5,488,425, Cl. 348-559.000.

Groner, Gabriel F.: *See—*
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Grubisic, Vatroslav: *See—*
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Guarda, Pier A.: *See—*
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Guativa, Alfonso C.; Schwenk, David M.; and Miller, James P., to United States of America, Army. Air velocity averaging rotor. 5,487,311, Cl. 73-861.770.

Guentert, Josef; and Brett, Hans, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 5,487,651, Cl. 417-499.000.

Guerra, Miguel A.: *See—*
Fall, David J.; and Guerra, Miguel A., 5,488,142, Cl. 560-227.000.

Guett, Herbert: *See—*
Fueller, Peter; Kuebler, Juergen; Guett, Herbert; and Amaseder, Franz, 5,487,564, Cl. 280-808.000.

Guha, Sujoy K. Contraceptive for use by a male. 5,488,075, Cl. 522-168.000.

Guidotti, Alessandro: *See—*
Costa, Erminio; Guidotti, Alessandro; Baraldi, Mario; Bertolino, Mariella; DiBella, Maria; and Vicini, Stefano, 5,488,049, Cl. 514-223.200.

Guillon, Jean-Claude; and Perdrieau, Laurent, to Laboratoire Europeen de Recherches Electroniques Avancees Societe en Nom Collectif. Video signal processing method for changing a video signal display format. 5,488,432, Cl. 348-717.000.

Gulati, Anil; Warren, Richard E., Jr.; and Voorhees, Eayre B., to General Electric Company. Screech suppressor for advanced low emissions gas turbine combustor. 5,487,274, Cl. 60-725.000.

Gunn, Daniel D.: *See—*
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Gupta, Surendra K.: *See—*
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Gupta, Vishwa N.: *See—*
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Gurski, Michael T., to Therm-O-Disc, Incorporated. Thermostat assembly with flanged disc cup. 5,488,347, Cl. 337-380.000.

Gutek, Beth I.: *See—*
Cobb, Vicky S.; Gutek, Beth I.; and Le Grow, Gary E., 5,488,124, Cl. 556-445.000.

Gutierrez, Eddie N.; and Wu, Shang-Ren, to Lever Brothers Company, Division of Conopco, Inc. Process for the preparation of sulfo carboxymethyloxysuccinic acid and its salts. 5,488,146, Cl. 562-109.000.

Gutteridge, Ronald J.: *See—*
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Guzik, Andrzej T.; Smith, Todd L.; and Marchuk, Jeffrey P., to Motorola, Inc. Surface mountable leaded package. 5,487,674, Cl. 439-83.000.

Haaga, John R. Biopxy system with hemostatic insert. 5,487,392, Cl. 123-753.000.

Haas, Jon A.: *See—*
Wentworth, Steven W.; Crane, Robert F.; and Haas, Jon A., 5,487,430, Cl. 173-91.000.

Haas, Ken A.: *See—*
Haas, Kevin L.; Haas, Ken A.; and Vought, Kimber J., 5,487,211, Cl. 29-25.350.

Haas, Kevin L.; Haas, Ken A.; and Vought, Kimber J., to Motorola, Inc. Method for fabricating a surface-mountable crystal resonator. 5,487,211, Cl. 29-25.350.

Haas, Wilhelm; Müller, Klaus-Helmut; König, Klaus; Santel, Hans-Joachim; Lürssen, Klaus; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Herbicidal sulphonylaminocarbonyltriazolinones having two substituents bonded via oxygen. 5,488,028, Cl. 504-193.000.

Habu, Yoshihiko: *See—*
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Hackman, Donald J.: *See—*
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Hacknauer, Frank: *See*—
Labudde, Brian R.; and Hacknauer, Frank, 5,488,453, Cl. 355-202.000.

Hafeman, Dean G.; and Humphries, Gillian M. K., to Molecular Device Corporation. Ultraviolet radiation transparent multi-assay plates. 5,487,872, Cl. 422-102.000.

Hagen, Timothy J.: *See*—
Chrusciel, Robert A.; Hagen, Timothy J.; Hallinan, E. Ann; Li, Jinglin; Tsymbalov, Sofya; and Reitz, David B., 5,488,046, Cl. 514-211.000.

Hajikano, Kazuo: *See*—
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Hale, Joseph F.; and Burgardt, Jeffrey, to Lin El, Inc. Storm shutter system. 5,487,243, Cl. 52-202.000.

Hale, Nathan S., to Sawgrass Systems, Inc., a South Carolina Corporation. Method of printing a multiple color image using heat sensitive inks. 5,487,614, Cl. 400-120.020.

Halladay, James R., to Lord Corporation. Highly damped organic elastomer composition. 5,488,081, Cl. 524-314.000.

Hallinan, E. Ann: *See*—
Chrusciel, Robert A.; Hagen, Timothy J.; Hallinan, E. Ann; Li, Jinglin; Tsymbalov, Sofya; and Reitz, David B., 5,488,046, Cl. 514-211.000.

Halson Designs, Inc.: *See*—
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Halter, Edward A.: *See*—
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Hama, Tomio, to Kabushiki Kaisha Harmo Souken. Crusher and a crushing mechanism for the same. 5,487,509, Cl. 241-152.200.

Hamade, Toshiharu; Shiotani, Masaichi; Shimo, Yukio; and Higashikata, Munehiko, to Nippon Telegraph and Telephone Corporation. Method and apparatus for judging active/dead status of communication cable. 5,488,304, Cl. 324-520.000.

Hamatani, Katsunori: *See*—
Kawakami, Yoshinaka; Takigawa, Yoshiharu; Isomura, Arihiro; Kamiya, Kouichi; and Hamatani, Katsunori, 5,488,353, Cl. 340-576.000.

Hamberg, Ivar: *See*—
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Hamilton, Eugene R.: *See*—
Otto, John G., III; Vanderwall, Ronald W.; Hamilton, Eugene R.; and Osborn, Kevin O., 5,487,289, Cl. 70-279.000.

Hamilton, James E.; Dawson, Gerald L.; and Thompson, Daniel L., to Mas-Hamilton Group. Electronic combination lock with closure and locking verification. 5,488,358, Cl. 340-825.310.

Hamlen, Glen A., to U S WEST Technologies, Inc. Method and system for controlling traffic in PSTN links through the use of variable price incentives. 5,488,655, Cl. 379-114.000.

Hammett, Roy, to International Container Systems, Inc. Crenelated container case. 5,487,487, Cl. 220-509.000.

Hammond, Mark B.: *See*—
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Hammond, Paul E.: *See*—
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Hamprecht, Gerhard; Mayer, Horst; Westphalen, Karl-Otto; Gerber, Matthias; Kardorff, Uwe; and Walter, Helmut, to BASF Aktiengesellschaft. Herbicidal N-[1,3,5-riazin-2-yl)-aminocarbonyl]-benzenesulfonamides. 5,488,029, Cl. 504-212.000.

Hampton, Leslie E.; and Weiss, David S., to Corning Incorporated. Method of making complex shaped metal bodies. 5,487,865, Cl. 419-5.000.

Han, Min-Ku; and Min, Byung-Hyuk, to Samsung Electronics Co., Ltd. Process for manufacturing an offset gate structure thin film transistor. 5,488,005, Cl. 437-41.000.

Han, Sung H.: *See*—
Uhm, Sung J.; Han, Sung H.; Oh, Jun W.; and Joo, Oh S., 5,488,143, Cl. 560-232.000.

Han, Yang Su: *See*—
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Hanada, Tooru: *See*—
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Hanafusa, Masahiro: *See*—
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Hancock, Peter G., to Honeywell Inc. Temperature compensated magnetically sensitive circuit. 5,488,296, Cl. 324-251.000.

Handke, Gerald, to Gottfried Joos Maschinenfabrik GmbH & Co. Platen press for woodworking. 5,487,332, Cl. 100-93.00P.

Hanford, Keith E.: *See*—
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Hanley, Peter, to Oxford Instruments Limited. Magnet assembly for NMR. 5,488,342, Cl. 335-306.000.

Hanna, Keith J., to David Sarnoff Research Center, Inc. Stabilizing estimate of location of target region inferred from tracked multiple landmark regions of a video image. 5,488,675, Cl. 382-284.000.

Hannah, Dale A. Paint roller cleaner. 5,487,399, Cl. 134-138.000.

Hans Oetiker AG Maschinen- und Apparatefabrik: *See*—
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Hansen, Bryan C.; and Hansen, Sharon A. Disposable tooth and gum cleaning device. 5,487,201, Cl. 15-104.940.

Hansen, Sharon A.: *See*—
Hansen, Bryan C.; and Hansen, Sharon A., 5,487,201, Cl. 15-104.940.

Hanson, Gunnar J., to G. D. Searle & Co. Alkylaminoalkyl-terminated sulfide/sulfonyl-containing propargyl amino-diol compounds for treatment of hypertension. 5,488,067, Cl. 514-618.000.

Hanson, Gunnar J.: *See*—
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Hanson, Joseph R., Jr., to Brown Group, Inc. Method for generating a computerized three dimensional model of a shoe heel and a two dimensional cover for the same. 5,488,699, Cl. 395-119.000.

Hanson, Michael J.: *See*—
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Hara, Takeshi; Hidano, Kouichi; Wakashiro, Teruo; Yamazaki, Kazumi; and Kawakami, Tomoyuki, to Honda Giken Kogyo Kabushiki Kaisha. Evaporative emission control system for internal combustion engines. 5,487,369, Cl. 123-520.000.

Harada, Hirotaka, to NEC Corporation. Analog-to-digital converter. 5,488,370, Cl. 341-161.000.

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Szweda, Andrew; Millard, Michael L.; and Harrison, Michael G., 5,488,017, Cl. 501-95.000.

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Heeren, Julius A.: *See*—
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Heimbuch, Scott D.: *See*—
Gove, Robert J.; Doherty, Donald B.; Heimbuch, Scott D.; Urbanus, Paul M.; and Marshall, Stephen W., 5,488,431, Cl. 348-716.000.
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Heine, Guenther: *See*—
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Henkel Corporation: *See*—
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Hercules Incorporated: *See—*
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Herrmann, James F.: *See—*
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Nguyen, Michael A.; Stewart, Lowell J.; Kline, Daniel S.; Boeller, Robert A.; Ta, Chuong C.; and Haselby, Robert D., 5,488,397, Cl. 347-40.000.
Seroussi, Gadiel; and Lempel, Abraham, 5,488,365, Cl. 341-51.000.
Shields, James P.; and Radke, Garold E., 5,488,402, Cl. 347-96.000.
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High, Kane M.: *See—*
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Hilton, Ronald N.: *See—*
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Himi, Hiroaki: *See—*
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Himmelwright, Richard S.: *See—*
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Hirabayashi, Hiromitsu: *See—*
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Hirakawa, Tatsuhiro: *See—*
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Hiramatsu, Koji, to Takata Corporation. Pretensioner for vehicle seat belt systems. 5,487,563, Cl. 280-806.000.

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Hiraoka, Tatushi, to Koito Manufacturing Co., Ltd. Headlamp for a motor vehicle. 5,488,547, Cl. 362-66.000.

Hirasawa, Masahide; and Takahashi, Kohji, to Canon Kabushiki Kaisha. Video camera apparatus having mode selection display on electronic viewfinder screen. 5,488,414, Cl. 348-207.000.

Hirashima, Masayoshi, to Matsushita Electric Industrial Co., Ltd. Video signal scrambling and descrambling apparatus. 5,488,658, Cl. 380-14.000.

Hirayama, Hiroshi: *See—*
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Hirooka, Kazuhiko: *See—*
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Asabuki, Hiroshi; Fujio, Masayuki; Watanabe, Takashi; Yamazaki, Susumu; and Ishida, Fumiaki, 5,487,639, Cl. 415-55.100.
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Hitachi Metals, Ltd.: *See—*
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Masghati, Mohammad; and Cline, Jack R., 5,488,535, Cl. 361-119.000.
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Orrico, Mario M. V.; Olson, William J.; Zielinski, James S.; and Crippen, Randall M., 5,488,209, Cl. 200-61.700.

Illuzzi, Vincent A.: *See—*
Houck, Warren B.; Illuzzi, Vincent A.; Ricker, Mary E.; and Vidil, Richard S., 5,488,693, Cl. 395-200.050.

Imai, Kunio: *See—*
Shirota, Yasuhiro; Inada, Hiroshi; Yonemoto, Yoshinobu; Wakimoto, Takeo; and Imai, Kunio, 5,487,953, Cl. 428-690.000.

Imakyure, Kaoru: *See—*
Kirigaya, Tadayuki; Imakyure, Kaoru; Ozaki, Hiroyasu; and Kurei, Hiroshi, 5,488,446, Cl. 354-289.100.

Imashiro, Yasuo; Horie, Naofumi; and Yamane, Takeshi, to Nisshinbo Industries, Inc. Process for producing 3-methyl-1-phenylphospholene oxide. 5,488,170, Cl. 568-12.000.

IMI Cornelius Inc.: *See—*
Goulet, Douglas P., 5,487,492, Cl. 222-129.100.

Immunex Corporation: *See—*
Dower, Steven K.; March, Carl J.; Sims, John E.; and Urdal, David L., 5,488,032, Cl. 514-2.000.

Imori, Toru: *See—*
Tilley, T. Don; and Imori, Toru, 5,488,091, Cl. 528-9.000.

Imperial Packaging, Inc.: *See—*
Galbierz, Richard T.; and Galbierz, Michael A., 5,487,464, Cl. 206-149.000.

Inaashi, Tadanobu: *See—*
Satake, Satoru; Inaashi, Tadanobu; and Ito, Takafumi, 5,487,472, Cl. 209-581.000.

Inada, Hiroshi: *See—*
Shirota, Yasuhiro; Inada, Hiroshi; Yonemoto, Yoshinobu; Wakimoto, Takeo; and Imai, Kunio, 5,487,953, Cl. 428-690.000.

Independent Concrete Pipe: *See—*
Tolliver, Wilbur E.; and Magnuson, Larry R., 5,487,251, Cl. 52-600.000.

Industrial Technology Research Institute: *See—*
Lin, Ran-Jin, 5,488,031, Cl. 505-475.000.
Wu, Druong-Yow, 5,488,366, Cl. 341-67.000.

Ingenieurburo S. Ficker Verfahrenstechnik: *See—*
Ficker, Stefan, 5,487,510, Cl. 241-199.600.

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Hutchinson, William R.; and Martin, Daniel T., 5,487,769, Cl. 55-442.000.

Ingram, William D.; and James, J. Steven, to Ivie Industries. Readily relocatable security mount which can hold articles with a wide range of dimensions. 5,487,523, Cl. 248-551.000.

Injeyan, Hagop; and Holcomb, Terry L., to TRW Inc. Ultracompact Q-switched microlasers and related method. 5,488,619, Cl. 372-12.000.

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Baird, William J., 5,487,504, Cl. 229-120.170.

Inland Steel Company: *See—*
Gerber, Howard L., 5,487,421, Cl. 164-467.000.

Inoue, Hiroshi: *See—*
Taniguchi, Osamu; Inoue, Hiroshi; Mizutome, Atsushi; Mihara, Tadashi; Onitsuka, Yoshihiro; and Terada, Masahiro, 5,488,388, Cl. 345-97.000.

Inoue, Satosi: *See—*
Sunouchi, Kazumasa; Takato, Hiroshi; Ozaki, Tohru; Okabe, Naoko; Hieda, Katsuhiko; Horiguchi, Fumio; Nitayama, Akihiro; Yamada, Takashi; Hasimoto, Kouji; and Inoue, Satosi, 5,488,242, Cl. 257-301.000.

Inoue, Yoshio: *See—*
Omura, Naoki; Igarashi, Minoru; Inoue, Yoshio; and Takahashi, Masaharu, 5,488,125, Cl. 556-463.000.

Insero, Mark A.: *See—*
Jacobs, Michael A.; and Insero, Mark A., 5,488,571, Cl. 364-705.070.

Intel Corporation: *See—*
Agarwal, Rohit, 5,488,570, Cl. 364-514.00R.
Bhattacharyya, Bidyut; and Mallik, Debendra, 5,488,257, Cl. 257-774.000.
Chambers, Stephen; Brown, Brian J.; Chern, Chan-Hong; Chau, Robert; and Yau, Leopoldo D., 5,488,003, Cl. 437-31.000.
Dreyer, Robert S., 5,488,728, Cl. 395-726.000.
Keith, Michael; Coelho, Rohan; Golin, Stuart; and Nickerson, Brian, 5,488,568, Cl. 364-514.00R.
MacWilliams, Peter D.; Avni, Dror; Liebermensch, Avi; Baransy, Anan; and Farrell, Robert L., 5,488,639, Cl. 375-355.000.

Intermec Corporation: *See—*
Austin, Pixie A.; Fox, Duane M.; and Wiklof, Christopher A., 5,488,223, Cl. 235-375.000.

International Business Machines Corporation: *See—*
Adams, George F.; and Kahwaty, Vincent N., 5,488,525, Cl. 360-104.000.
Agnello, Paul D.; and Sedgwick, Thomas O., 5,487,783, Cl. 118-715.000.
Agrawal, Rakesh; De Michiel, Linda G.; and Lindsay, Bruce G., 5,488,727, Cl. 395-700.000.
Bailey, Warren D.; Barker, Kenenth J.; Bellinghausen, Joan M.; Calhoun, George M.; Naudin, Bernard J.; and Suffern, Edward, 5,488,734, Cl. 395-800.000.
Bhatt, Anilkumar C.; Magnuson, Roy H.; Markovich, Voya R.; Papathomas, Konstantinos I.; and Powell, Douglas O., 5,487,218, Cl. 29-852.000.
Bonaccio, Anthony R., 5,488,306, Cl. 324-539.000.
Brady, James T.; and Menon, Jaishankar M., 5,488,701, Cl. 395-182.040.
Brandt, Wolfram; Marquart, Bernd; and Stoehr, Roland R., 5,488,314, Cl. 324-758.000.
Cassidy, Bruce M., 5,488,533, Cl. 361-18.000.
Chen, Mao-Min; Ju, Kochan; Robertson, Neil L.; and Wang, Po-Kang, 5,488,528, Cl. 360-126.000.
Cunningham, Earl A., 5,488,524, Cl. 360-103.000.
Ferree, Marsha E.; and Gray, James P., 5,488,703, Cl. 395-200.120.
Fujii, Yoshiharu; and Yoshida, Toshihiko, 5,488,498, Cl. 359-88.000.
Fuoco, Daniel P.; Herring, Christopher M.; Kellogg, Mark W.; and Lenta, Jorge E., 5,488,691, Cl. 395-185.050.
Geffken, Robert M.; and Rutten, Matthew J., 5,488,013, Cl. 437-187.000.
Gharachorloo, Nader; and Luken, William L., 5,488,684, Cl. 395-123.000.
Heybruck, William F., 5,488,612, Cl. 371-22.200.
Karasick, Michael S.; and Strip, David R., 5,488,692, Cl. 395-120.000.
Lo, Tin-chee, 5,488,319, Cl. 326-115.000.
Malik, Randhir S., 5,488,551, Cl. 363-20.000.
Mendelsohn, Noah, 5,488,731, Cl. 395-800.000.
Murphy, Alan S.; and Tustin, Patricia, 5,488,686, Cl. 395-161.000.
Phillips, James E.; and Vassiliadis, Stamatis, 5,488,707, Cl. 395-420.000.
Potok, Thomas E., 5,488,722, Cl. 395-600.000.
Rich, William L.; and Shackelford, Floyd W., 5,488,721, Cl. 395-600.000.
Tsukada, Yutaka, 5,488,200, Cl. 174-261.000.
Walters, Michael M., 5,487,214, Cl. 29-602.100.
Wong, Hon-Sum P., 5,488,010, Cl. 437-53.000.

International Container Systems, Inc.: *See—*
Hammett, Roy, 5,487,487, Cl. 220-509.000.

International Envelope Company, Inc.: *See—*
Back, Gordon E.; and Greer, Jeffrey P., 5,487,826, Cl. 206-308.300.

Interpore International: *See—*
White, Eugene W., 5,487,933, Cl. 428-131.000.

Interspec. Inc.: *See—*
Rello, Michael J.; and Derman, Richard M., 5,487,388, Cl. 128-660.090.

Inui, Kenichi, to Sharp Kabushiki Kaisha. Apparatus with deletion safeguard for setting a number of data in temporary deletion state and independently releasing or deleting any one of the data. 5,488,720, Cl. 395-600.000.

Invitrogen Corporation: *See—*
Herrnstadt, Corinna; Fernandez, Joseph M.; Smith, Lloyd; and Mead, David A., 5,487,993, Cl. 435-172.300.

Iotow, Takashi: *See—*
Ueda, Tomohiro; Iotow, Takashi; Asamura, Yoshinori; Onishi, Ken; and Mishima, Hidetoshi, 5,488,482, Cl. 358-339.000.

Ipex Inc.: *See—*
Goncalves, Joseph E. F., 5,487,411, Cl. 138-98.000.

Ipsen, Richard E. Adhesive form assembly. 5,487,568, Cl. 283-81.000.
Irie, Tadashi: *See—*
Nishitani, Yasuhiro; Irie, Tadashi; and Nishino, Yutaka, 5,488,107, Cl. 540-541.000.
Irie, Yasuo: *See—*
Sumikawa, Michito; Koguchi, Yoshihito; Ohgane, Takao; Irie, Yasuo; and Takahashi, Satoji, 5,488,150, Cl. 562-450.000.
Isaka, Yoshiharu, to Yamaha Hatsudoki Kabushiki Kaisha. Induction system for engine. 5,487,365, Cl. 123-306.000.
Isanhart, Bowdie J., to Entrepreneurial Technologies, Inc. Pressure activated rotary clutch. 5,487,457, Cl. 192-58.200.
Ishida, Fumiaki: *See—*
Asabuki, Hiroshi; Fujio, Masayuki; Watanabe, Takashi; Yamazaki, Susumu; and Ishida, Fumiaki, 5,487,639, Cl. 415-55.100.
Ishida, Takehisa; and Takino, Hiroshi, to Sony Corporation. Recording and reproducing device having conductive spindle. 5,488,519, Cl. 360-77.030.
Ishida, Yoshiyuki: *See—*
Nagao, Mitsuhiro; Shimbayashi, Kohji; and Ishida, Yoshiyuki, 5,488,581, Cl. 365-189.050.
Ishigaki, Eiichi; Oura, Kazumitsu; and Honda, Takaharu, to Ishigaki Mechanical Industry Co., Ltd. Pump having a single or a plurality of helical blades. 5,487,644, Cl. 415-220.000.
Ishigaki Mechanical Industry Co., Ltd: *See—*
Ishigaki, Eiichi; Oura, Kazumitsu; and Honda, Takaharu, 5,487,644, Cl. 415-220.000.
Ishikawa, Masaaki; Iguchi, Michihisa; Hashizume, Hiroshi; Nakamura, Tetsuya; Satou, Kouichirou; Okano, Yoshiaki; Fukuyama, Hirotaka; Katagata, Satoshi; Ishikawa, Takashi; Arai, Seiji; Sakai, Chinobu; and Kabai, Takahito, to Kabushiki Kaisha Toshiba. Electrophotographic apparatus having developing device with seals for preventing toner leakage. 5,488,462, Cl. 355-215.000.
Ishikawa, Masayuki; Nishikawa, Yukie; Saito, Shinji; Parbrook, Peter J.; Onomura, Masaaki; Nitta, Koichi; and Hatakoshi, Genichi, to Kabushiki Kaisha Toshiba. Semiconductor light-emitting device with compound semiconductor layer. 5,488,233, Cl. 257-94.000.
Ishikawa, Takashi: *See—*
Ishikawa, Masaaki; Iguchi, Michihisa; Hashizume, Hiroshi; Nakamura, Tetsuya; Satou, Kouichirou; Okano, Yoshiaki; Fukuyama, Hirotaka; Katagata, Satoshi; Ishikawa, Takashi; Arai, Seiji; Sakai, Chinobu; and Kabai, Takahito, 5,488,462, Cl. 355-215.000.
Ishimaru, Kenji: *See—*
Ikeda, Yoshihiko; Yamane, Takeo; Kaji, Eiichi; and Ishimaru, Kenji, 5,488,169, Cl. 568-3.000.
Ishimatsu, Yoshikazu, to Sony Corporation. Disc cartridge with easily assembled slider and shutter means. 5,488,605, Cl. 369-291.000.
Ishioka, Takuji: *See—*
Maruyama, Shigeru; Shimasaki, Yuichi; Kanehiro, Masaki; Hisaki, Takashi; Baba, Shigeki; Ishioka, Takuji; Takagi, Jiro; and Akiyama, Eitetsu, 5,487,676, Cl. 439-125.000.
Ishizu, Masanori: *See—*
Nakamori, Tomohiro; Hashimoto, Hiroshi; Endo, Soya; Machino, Hitoshi; and Ishizu, Masanori, 5,488,625, Cl. 372-50.000.
Iskra, Joseph W., Jr.; and Havener, John A. Pneumatic wheelchair cushion. 5,487,197, Cl. 5-654.000.
Ismar Maschinen GmbH: *See—*
Zehle, Gunter; Juhnke, Hubert; and Ismar, Thomas T., 5,487,605, Cl. 366-300.000.
Ismar, Thomas T.: *See—*
Zehle, Gunter; Juhnke, Hubert; and Ismar, Thomas T., 5,487,605, Cl. 366-300.000.
Isomura, Arihiro: *See—*
Kawakami, Yoshinaka; Takigawa, Yoshiharu; Isomura, Arihiro; Kamiya, Kouichi; and Hamatani, Katsunori, 5,488,353, Cl. 340-576.000.
Isomura, Shigenori: *See—*
Yamashita, Yukihiro; Ikuta, Kenji; and Isomura, Shigenori, 5,487,270, Cl. 60-276.000.
Isomura, Tohru: *See—*
Mouri, Takayuki; and Isomura, Tohru, 5,487,520, Cl. 248-429.000.
Ito, Hideo: *See—*
Yabe, Hisao; Iida, Yoshihiro; Suzuki, Akira; Ito, Hideo; Tashiro, Yoshio; Yamazaki, Minoru; and Tamada, Osamu, 5,487,376, Cl. 600-121.000.
Ito, Kenji, to Kabushiki Kaisha Toshiba. MCM manufactured by using thin film multilevel interconnection technique. 5,488,542, Cl. 361-793.000.
Ito, Takafumi: *See—*
Satake, Satoru; Inaashi, Tadanobu; and Ito, Takafumi, 5,487,472, Cl. 209-581.000.
Ito, Takakazu. Multi-directional rolling massager. 5,487,723, Cl. 601-99.000.
Itoh, Hiroki; Tabata, Tetsuro; and Kikuta, Jun-Ichi, to Takeda Chemical Industries, Limited. Stabilized vitamin D preparation. 5,487,900, Cl. 424-451.000.
Itoh, Michio: *See—*
Ojima, Masaki; Ohkubo, Masaharu; Itoh, Michio; Sasame, Hiroshi; Yamada, Hiromichi; Saito, Tetsuo; Kashihara, Atsushi; Kawana, Takashi; Mano, Hiroshi; Seto, Kaoru; and Atobe, Hiroshi, 5,488,487, Cl. 358-456.000.
Itoh, Takashi; and Kosaki, Yukio, to N.E. Chemcat Corporation. Catalyst for purifying exhaust gas and method of purifying exhaust gas. 5,487,268, Cl. 60-274.000.
Itow, Takashi: *See—*
Mishima, Hidetoshi; and Itow, Takashi, 5,488,418, Cl. 348-398.000.
Itozaki, Hideo: *See—*
Tanaka, Saburo; Matsuura, Takashi; and Itozaki, Hideo, 5,488,030, Cl. 505-190.000.
ITT Automotive Europe GmbH: *See—*
Feigel, Hans-Jörg, 5,487,455, Cl. 188-299.000.
ITT Corporation: *See—*
Floryan, Richard F.; and Frisch, David D., 5,487,689, Cl. 445-29.000.
Panek, John G.; and Gottorff, Richard L., 5,487,573, Cl. 285-332.000.
ITW Oberflachentechnik GmbH: *See—*
Seewaldt, Kurt, 5,487,782, Cl. 118-621.000.
Ivie Industries: *See—*
Ingram, William D.; and James, J. Steven, 5,487,523, Cl. 248-551.000.
Iwama, Ryoichi, to Fujitsu Limited. Serial type electrophotography printer for forming a latent image and developing and printing the developed image. 5,488,452, Cl. 355-202.000.
Iwanaga, Masao: *See—*
Toyota, Hiromichi; and Iwanaga, Masao, 5,487,624, Cl. 406-14.000.
Iwasawa, Yoshikazu: *See—*
Nomoto, Takashi; Hayashi, Masahiro; Shibata, Jun; Iwasawa, Yoshikazu; Mitsuya, Morihiro; Iida, Yoshiaki; Nonoshita, Katsumasa; and Nagata, Yasufumi, 5,488,149, Cl. 562-449.000.
Izawa, Makoto: *See—*
Sato, Osamu; Hayami, Toshihisa; Ohashi, Hideki; Izawa, Makoto; Serizawa, Tomoaki; and Uchida, Hideki, 5,488,546, Cl. 362-61.000.
J & M Turner, Inc.: *See—*
Hood, A. Craig; and Larson, Lloyd J., 5,487,632, Cl. 411-10.000.
J.M. Voith GmbH: *See—*
Schiel, Christian, 5,487,715, Cl. 492-16.000.
J. P. Walls, Inc.: *See—*
Yount, Patty L.; and Fisher, Jacob E., Jr., 5,487,250, Cl. 52-417.000.
Jäckel, Johann: *See—*
Friedmann, Oswald; and Jäckel, Johann, 5,487,704, Cl. 464-24.000.
Jackson, Andrew: *See—*
Chu, Alice S.; Jackson, Andrew; and Wu, Margaret M., 5,488,191, Cl. 585-10.000.
Jackson, Kenneth J.: *See—*
Carman, Margaret L.; Jackson, Kenneth J.; Knapp, Richard B.; Knezovich, John P.; Shah, Nilesh N.; and Taylor, Robert T., 5,487,834, Cl. 210-606.000.
Jackson, Thomas; and Murr, Mark, to Hughes Aircraft Company. Apparatus and method for positioning an antenna in a remote ground terminal. 5,488,379, Cl. 342-359.000.
Jackson, Thomas C., to Complex Chemicals, Corp. Alkyl substituted metal alkylalkoxyhydroborate reducing agents, and processes for production and use of the same. 5,488,122, Cl. 556-8.000.
Jacobs, Melvin T.: *See—*
Williams, John R.; and Jacobs, Melvin T., 5,487,352, Cl. 116-218.000.
Jacobs, Michael A.; and Insero, Mark A., to Timex Corporation. Method and apparatus for downloading information from a controllable light source to a portable information device. 5,488,571, Cl. 364-705.070.
Jager, Willem W.: *See—*
Drent, Eit; and Jager, Willem W., 5,488,175, Cl. 568-454.000.
Jamas, Spiros; Basson, D. Davidson, Jr.; and Ostroff, Gary R., to Alpha-Beta Technology, Inc. Use of neutral soluble glucan preparations to stimulate platelet production. 5,488,040, Cl. 514-54.000.
James, J. Steven: *See—*
Ingram, William D.; and James, J. Steven, 5,487,523, Cl. 248-551.000.
Jamieson, Robert S. Method and apparatus for monitoring the state of charge of a battery. 5,488,300, Cl. 324-432.000.
Jaminet, Jerome F.: *See—*
Barrett, David W.; McHugh, Thomas M.; Ahigian, Edward E.; Jaminet, Jerome F.; He, Thomas; Peruggi, Richard E.; Kowalcyk, Thomas M.; and Kulak, Richard E., 5,487,449, Cl. 187-330.000.
Jamriska, David J.: *See—*
Taylor, Wayne A.; Heaton, Richard C.; and Jamriska, David J., 5,487,880, Cl. 423-2.000.
Jamzadeh, Feraydoon S., to Eastman Kodak Company. Method and apparatus for detecting which side of a recording sheet contains a coating. 5,488,456, Cl. 355-203.000.
Janhonen, Veikko, to Pussikesku Oy. Packaging method for wrapping books or the like. 5,487,255, Cl. 53-461.000.
January, Daniel B., to Hunter Engineering Company. Apparatus for determining vehicle wheel alignment positions and orientations. 5,488,472, Cl. 356-139.090.
January, Daniel B.: *See—*
McClenahan, James W.; Burns, Leigh R., Jr.; Stieff, Michael T.; and January, Daniel B., 5,488,471, Cl. 356-139.090.
Japan Electronic Control Systems Co., Ltd.: *See—*
Kamioka, Hideki; Kobayashi, Kazumitsu; Shimamura, Masahiko; and Takeuchi, Kiyoshi, 5,488,311, Cl. 324-674.000.
Japan Energy Corporation: *See—*
Sawada, Susumu; Anan, Junichi; Nakamura, Hiroki; and Sakaya, Yoshihiro, 5,487,823, Cl. 204-298.120.
Japan Petroleum Exploration Co., Ltd.: *See—*
Ohno, Takamasa; Kato, Keietsu; Yamaguchi, Yoshiyuki; Murakami, Masami; Suzuki, Shogo; Kanda, Shoichi; and Nakagawa, Tsuyoshi, 5,487,425, Cl. 166-295.000.
Jaraczewski, Richard S.: *See—*
Truckai, Csaba; Jaraczewski, Richard S.; Nguyen, Frank; and West, Scott H., 5,487,757, Cl. 607-122.000.
Jarvis, Brian J.: *See—*
Patnode, Eric T.; and Jarvis, Brian J., 5,487,446, Cl. 182-148.000.

Jasper, Kenneth O., to Vehicle Enhancement Systems, Inc. Communications and control system for tractor/trailer and associated method. 5,488,352, Cl. 340-431.000.

Jaszewski, Wayne M.: *See—*
Idzikowski, George D.; Jaszewski, Wayne M.; and Phillips, George E., 5,487,687, Cl. 440-77.000.

Jeffrey, Peter, to Safe-T-Limited. Syringe with retractable needle. 5,487,732, Cl. 604-110.000.

Jeng, Shin-Puu: *See—*
Havemann, Robert H.; Jeng, Shin-Puu; Gnade, Bruce E.; and Cho, Chih-Chen, 5,488,015, Cl. 437-195.000.

Jenkins, Jeffrey A.; and Wiers, John W., to TRW Vehicle Safety Systems Inc. Air bag module. 5,487,556, Cl. 280-728.200.

Jenkins, Richard D.; Bassett, David R.; Smith, Danny E.; Argyropoulos, John N.; Loftus, James E.; and Shay, Gregory D., to Union Carbide Chemicals & Plastics Technology Corporation. Complex hydrophobe compounds. 5,488,180, Cl. 568-609.000.

Jenkins, Thomas E.; Mulligan, Charles R.; and Jubenville, Duane, to General Electric Company. Refrigerator gasket assembly. 5,487,239, Cl. 49-498.100.

Jennings, David J.: *See—*
Leuthold, Hans; Jennings, David J.; Clark, Wesley R.; Khan, Raquib; and Heine, Guenther, 5,487,608, Cl. 384-113.000.

Jensen, Borge R.: *See—*
Robertson, Paul A.; Houzego, Peter J.; Jensen, Borge R.; Creeke, Murray A.; Emerton, Neil; Hodson, Peter D.; and Baum, Eric A., 5,487,378, Cl. 128-200.160.

Jensen, Elmer W., to Rodel, Inc. Polishing apparatus and method using a rotary work holder travelling down a rail for polishing a workpiece with linear pads. 5,487,697, Cl. 451-324.000.

Jeon, Ki U.: *See—*
Choi, Soon C.; and Jeon, Ki U., 5,488,436, Cl. 348-751.000.

Jeong, Jechang; and Shin, Hyunsoo, to Samsung Electronics Co., Ltd. Decoding method and apparatus having optimum decoding paths. 5,488,637, Cl. 375-341.000.

Jerbron Limited: *See—*
Brown, Peter E.; and Harrison, Stephen J., 5,487,206, Cl. 16-52.000.

Jespersen, Lee, to Wahpeton Canvas Co. South Dakota, Inc. Swing away support system for a covering. 5,487,584, Cl. 296-100.000.

Jess Clarke & Sons, Inc.: *See—*
Davis, Robert H., 5,487,899, Cl. 424-443.000.

Jewell, Arnold W. Trigger mechanism for firearms. 5,487,233, Cl. 42-69.010.

Jewett, Peter H.: *See—*
Vegesna, Anantakotiraju; Avula, Jayachandra B.; Jewett, Peter H.; and Mundkur, Yatin G., 5,488,729, Cl. 395-800.000.

Jinotti, Walter J. Closed system for treating pulmonary patient. 5,487,381, Cl. 128-207.140.

Jirasek, James D. Drain control valve and manifold system. 5,487,406, Cl. 137-519.000.

Johansson, Eric B.; Elkins, Robert B.; Matzner, Bruce; Latter, Gerald M.; and Proebstle, Richard A., to General Electric Company. Lower tie plate debris catcher for a nuclear reactor. 5,488,634, Cl. 376-313.000.

Johansson, Eric B., to General Electric Company. Spring assemblies for adjoining nuclear fuel rod containing ferrules and a spacer formed of the spring assemblies and ferrules. 5,488,644, Cl. 376-441.000.

Johansson, Ted; Leighton, Larry; and Hamberg, Ivar, to Telefonaktiebolaget L M Erricsson. Layout for radio frequency power transistors. 5,488,252, Cl. 257-579.000.

Johns Hopkins University, The: *See—*
Chandrasegaran, Srinivasan, 5,487,994, Cl. 435-199.000.

Johnson Electric S.A.: *See—*
Heyraud, Marc A., 5,488,260, Cl. 310-156.000.

Johnson, E. Paul: *See—*
Roshdy, Constance; and Johnson, E. Paul, 5,487,469, Cl. 206-363.000.

Johnson, Gary D.; and Hochfeld, Stanley, to Holtz, Leonard. Windproof umbrella. 5,487,401, Cl. 135-33.700.

Johnson, Leo F.: *See—*
Thrash, Robert J.; and Johnson, Leo F., 5,488,624, Cl. 372-41.000.

Johnson, Mark G., to Rambus, Inc. Static high speed comparator. 5,488,321, Cl. 327-66.000.

Johnson, Marvin M.: *See—*
Cheung, Tin-Tack P.; Johnson, Marvin M.; Brown, Scott H.; Zisman, Stan A.; and Kimble, James B., 5,488,024, Cl. 502-325.000.

Johnson, Paul H., to Microsensor Technology, Inc. Fluid-lock fixed-volume injector. 5,487,313, Cl. 73-863.710.

Johnson, Richard J.: *See—*
Dougherty, Thomas J.; Wruck, William J.; and Johnson, Richard J., 5,488,283, Cl. 320-15.000.

Johnson, Stephen B.: *See—*
Aneja, Arun P.; Bennie, David G.; Collins, Robert J.; Frankfort, Hans Rudolf E.; Johnson, Stephen B.; Knox, Benjamin H.; and Most, Elmer E., Jr., 5,487,859, Cl. 264-103.000.

Johnston, James D.; and Sinha, Deepen, to AT&T Corp. Multi-channel perceptual audio compression system with encoding mode switching among matrixed channels. 5,488,665, Cl. 381-2.000.

Johnstone Pump Company: *See—*
Brennan, Thomas J.; DeFillipi, Michael E.; Gnyp, Steven M.; and Kremer, Gregory D., 5,487,781, Cl. 118-300.000.

Jones, Anthony M.; and Barnes, David A., to Discovision Associates. Clock divider. 5,488,646, Cl. 377-47.000.

Joo, Ho-gul, to Samsung Electronics Co., Ltd. Infinite-distance detecting circuit for an auto-focus system. 5,488,449, Cl. 354-402.000.

Joo, Oh S.: *See—*
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Hama, Tomio, 5,487,509, Cl. 241-152.200.

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Hatakeyama, Kunio; and Habu, Yoshihiko, 5,487,413, Cl. 139-116.200.

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Ito, Kenji, 5,488,542, Cl. 361-793.000.
Kimura, Koji; and Taka, Shin-ichi, 5,488,002, Cl. 437-31.000.
Kondo, Masafumi; and Kawamoto, Hiromi, 5,488,299, Cl. 324-318.000.
Masuoka, Hideaki; and Kuroda, Akio, 5,488,330, Cl. 330-261.000.
Miyano, Yuichi, 5,488,484, Cl. 358-433.000.
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Shimizu, Nobukazu, 5,488,488, Cl. 358-468.000.
Shiraishi, Sumako; Masuda, Masami; and Nogami, Kazutaka, 5,488,326, Cl. 327-408.000.

Sunouchi, Kazumasa; Takato, Hiroshi; Ozaki, Tohru; Okabe, Naoko; Hieda, Katsuhiko; Horiguchi, Fumio; Nitayama, Akihiro; Yamada, Takashi; Hasimoto, Kouji; and Inoue, Satosi, 5,488,242, Cl. 257-301.000.

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Sakamoto, Mitsuo; Koshika, Norihide; Nishimura, Isao; Sasaki, Katsuyasu; and Oorui, Satoshi, 5,487,534, Cl. 267-141.100.

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Kao Corporation: *See*—
Sotoya, Kohshiro; Abe, Hiroshi; Aikawa, Jun; Taniguchi, Hideki; and Nishimoto, Uichiro, 5,488,168, Cl. 564-506.000.

Yokoyama, Takaaki; Sasaki, Hirotaka; Ohno, Yumiko; Nakajima, Kentaro; Miura, Yasuhiro; and Mori, Hideki, 5,487,903, Cl. 426-56.000.

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Burke, Edward F.; and Karambelas, Randy C., 5,488,396, Cl. 347-37.000.

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Karlsson, Sven: *See*—
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Kasahara, Shigeo; Sueoka, Kiyoshi; Takayama, Gen; Satoh, Shingo; and Houjyou, Hidemi, to Toshiba Battery Co., Ltd. Electrolyte injection apparatus. 5,487,417, Cl. 141-32.000.

Käser, Adolf, to Ciba-Geigy Corporation. Process for dyeing paper with disazo dyes. 5,487,761, Cl. 8-527.000.

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Kashiyama, Motohisa: *See*—
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Kashizaki, Yoshio: *See*—
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Kasuga, Ikuo: *See*—

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Katahira, Masaki: *See*—
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Kataoka, Hiroshi: *See*—
Takahashi, Koichi; Kataoka, Hiroshi; Ichikawa, Haruo; Takatori, Tetsuya; and Naito, Toshiharu, 5,487,513, Cl. 242-348.100.

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Katsuyama, Akira: *See*—
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Katz, Gary E.: *See*—
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Kausch, Charles M.; Melby, Earl G.; and Sharma, Satish C., to GenCorp Inc. Low VOC, primerless, polyurethane compostions. 5,488,092, Cl. 528-60.000.

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Kawaguchi, Tomio: *See*—
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Kawakami, Kazuhisa: *See*—
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Hara, Takeshi; Hidano, Kouichi; Wakashiro, Teruo; Yamazaki, Kazumi; and Kawakami, Tomoyuki, 5,487,369, Cl. 123-520.000.

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Yamato, Kunitada; Fuji, Masato; and Fukuda, Naohiro, 5,488,689, Cl. 395-99.000.

Kawasaki Steel Corporation: *See*—
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Tobiyama, Yoichi; Kato, Chiaki; Morito, Nobuyuki; and Kimura, Hajime, 5,487,919, Cl. 427-327.000.

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Kawashima, Eric H.: *See*—
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Kawashima, Kazunari: *See*—
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Kawashita, Hideo: *See*—
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Kayane, Yutaka: *See*—
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Bader, Martina; and Kerscher, Volker, 5,488,128, Cl. 558-251.000.

Kersey, Alan D.: *See*—
Friebele, Edward J.; and Kersey, Alan D., 5,488,475, Cl. 356-352.000.

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Ueda, Tsunesuke; Kusama, Tadao; and Honma, Kazuo, 5,487,911, Cl. 426-614.000.

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Brach, Philip L., Jr.; Khalil, Charles; and Mead, Robert W., 5,487,203, Cl. 15-245.000.

Khan, Raquib: *See*—
Leuthold, Hans; Jennings, David J.; Clark, Wesley R.; Khan, Raquib; and Heine, Guenther, 5,487,608, Cl. 384-113.000.

Khatib, Khal M.: *See*—
Russ, Timothy J.; Khatib, Khal M.; and Baker, Jay O., 5,487,915, Cl. 427-208.000.

Kheraluwala, Mustansir H.: *See*—
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Kim, Jong-Kyu; and Lee, Jin-Suk, to Dong Won Metal Ind. Co., Ltd. Method for heat treating an impact beam of automotive vehicle door and a system of the same. 5,487,795, Cl. 148-520.000.

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Min, Suk-ki; and Kim, Yong T., 5,487,923, Cl. 427-569.000.

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Bell, Richard H., 5,487,189, Cl. 2-79.000.

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Cheung, Tin-Tack P.; Johnson, Marvin M.; Brown, Scott H.; Zisman, Stan A.; and Kimble, James B., 5,488,024, Cl. 502-325.000.

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Tobiyama, Yoichi; Kato, Chiaki; Morito, Nobuyuki; and Kimura, Hajime, 5,487,919, Cl. 427-327.000.

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Radons, Stephen W.; King, Steven L.; Mills, Randall D.; and Cristobal, Cliff, 5,487,751, Cl. 607-1.000.

Kinkaide, James R., to Wells Cargo, Inc. Frame for securing a wind deflector to a trailer. 5,487,586, Cl. 296-180.100.

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Finet, Philip J.; and Kirkham, Edward, 5,487,315, Cl. 73-865.900.

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Sharma, Umesh; Hayden, Jim; and Kirsch, Howard C., 5,488,579, Cl. 365-185.000.

Kitamura, Shoji; Shindo, Yoichi; and Amano, Akira, to Fuji Electric Co., Ltd. Mold-type semiconductor laser device with reduced light-emitting point displacement during operation. 5,488,623, Cl. 372-36.000.

Kitamura, Takuya, to Sony Corporation. Method of and apparatus for generating variable length code table. 5,488,367, Cl. 341-106.000.

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Nishimura, Asao; Kitano, Makoto; and Shimizu, Ichio, 5,488,254, Cl. 257-707.000.

Kiuchi, Toyoo, to NEC Corporation. Memory circuit with pipeline processing. 5,488,712, Cl. 395-431.000.

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Akkermans, Gerardus W. A.; Braun, Augustinus L.; and Klerk, Sander J., 5,488,517, Cl. 360-53.000.

Kletke, Hans-Jürgen: *See*—
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Kline, Daniel S.: *See*—
Nguyen, Michael A.; Stewart, Lowell J.; Kline, Daniel S.; Boeller, Robert A.; Ta, Chuong C.; and Haselby, Robert D., 5,488,397, Cl. 347-40.000.

Knapp, Richard B.: *See*—
Carman, Margaret L.; Jackson, Kenneth J.; Knapp, Richard B.; Knezovich, John P.; Shah, Nilesh N.; and Taylor, Robert T., 5,487,834, Cl. 210-606.000.

Knee, Raymond W. Fishing equipment storage apparatus. 5,487,475, Cl. 211-70.800.

Kneepkens, Franciscus A.: *See*—
Kalfs, Johannes J. W.; and Kneepkens, Franciscus A., 5,488,516, Cl. 360-51.000.

Knezovich, John P.: *See*—
Carman, Margaret L.; Jackson, Kenneth J.; Knapp, Richard B.; Knezovich, John P.; Shah, Nilesh N.; and Taylor, Robert T., 5,487,834, Cl. 210-606.000.

Knifton, John F.; Marquis, Edward T.; and Dai, Pei-Shing E., to Texaco Chemical Inc. Ditertiary butyl peroxide preparation from tertiary butyl hydroperoxide. 5,488,178, Cl. 568-578.000.

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Knipple, Douglas C.: *See*—
Soderlund, David M.; Knipple, Douglas C.; and Henderson, Joseph E., 5,487,976, Cl. 435-7.210.

Knoblock, Glenn A., to Steelcase, Inc. Back shell with selective stiffening. 5,487,591, Cl. 297-452.140.

Knodel, Bryan D.; Thompson, Bennie; and Nuchols, Richard P., to Ethicon Endo-Surgery, Inc. Surgical stapler instrument. 5,487,500, Cl. 227-181.100.

Knoerzer, Anthony R.: *See*—
Bianchini, Eber C.; Knoerzer, Anthony R.; Parr, Larry A.; and Reid, Leland W., 5,487,940, Cl. 428-349.000.

Knox, Benjamin H.: *See*—
Aneja, Arun P.; Bennie, David G.; Collins, Robert J.; Frankfort, Hans Rudolf E.; Johnson, Stephen B.; Knox, Benjamin H.; and Most, Elmer E., Jr., 5,487,859, Cl. 264-103.000.

Knutson, Joyce C.; Bishop, Charles W.; and Moriarty, Robert M., to Lunar Corporation. 1α-hydroxy vitamin D_4 and novel intermediates and analogues. 5,488,120, Cl. 552-653.000.

Kobayashi, Fumikazu; Mitsutani, Kazuyuki; and Muemoto, Kazuo, to Fuji Photo Film Co., Ltd. Phenol compounds containing methoxymethyl group or hydroxymethyl group. 5,488,182, Cl. 568-660.000.
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Kobayashi, Hidetoshi: *See*—
Hirokawa, Yuki; and Kobayashi, Hidetoshi, 5,487,968, Cl. 430-544.000.
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Kobayashi, Kazunobu: *See*—
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Kobayashi, Kazunori: *See*—
Tsuda, Tadayuki; Sekino, Kazunori; Ikemoto, Isao; Watanabe, Kazushi; Sasago, Yoshikazu; Shimizu, Yasushi; Noda, Shinya; and Kobayashi, Kazunori, 5,488,459, Cl. 355-211.000.
Kobayashi, Michio; Hirayama, Hiroshi; and Nobuhi, Satoshi, to Seiko Epson Corporation. Improved magneto-optical recording apparatus for digital signal information. 5,488,591, Cl. 369-13.000.
Kobayashi, Tohru: *See*—
Mitomi, Tatsuo; Aoki, Tomohiro; Murayama, Yasushi; Uchida, Takashi; Kobayashi, Tohru; Ikkai, Masamichi; and Nemura, Masaharu, 5,488,399, Cl. 347-43.000.
Kobelka, Frank: *See*—
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Koch, Robert; Mossner, Knud; and Schleicher, Roland, to Hubner Gummi - und Kunststoff GmbH. Hinge connection between two vehicles connected to each other in an articulated manner. 5,487,555, Cl. 280-403.000.
Kogaswara, Satoshi, to Juki Corporation. Looper thread paying-out apparatus for sewing machine. 5,487,347, Cl. 112-242.000.
Koguchi, Yoshihiro: *See*—
Itamikawa, Michiro; Koguchi, Yoshihiro; Ohgane, Takao; Irie, Yasuo; and Takahashi, Saniji, 5,488,150, Cl. 562-450.000.
Koh, Shokyo: *See*—
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Kohen, Bruno: *See*—
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Koida, Hidenobu, to Fuji Electric Co., Ltd. Optical current transformer. 5,488,291, Cl. 324-96.000.
Koilpillai, Ravindar D.: *See*—
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Koito Manufacturing Co., Ltd.: *See*—
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Sato, Osamu; Hayami, Toshihisa; Ohashi, Hideki; Izawa, Makoto; Shirizawa, Tomoaki; and Uchida, Hideki, 5,488,546, Cl. 362-61.000.
Koizumi, Ryoichi: *See*—
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Kojima, Kazuaki; Kuno, Tetsuya; Sugiura, Hiroaki; and Yamada, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Video signal processor for detecting flesh tones in an image. 5,488,429, Cl. 348-653.000.
Kokkeborg, Rune. Layer for stabilization of lithium anode. 5,487,959, Cl. 429-191.000.
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Takishima, Yasuhiro; Wada, Masahiro; and Murakami, Hitoshi, 5,488,616, Cl. 371-30.000.
Kolczynski, Raymond J.: *See*—
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Kolen, Paul T.: *See*—
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Kolthammer, Brian W. S.: *See*—
Spencer, Lee; Kolthammer, Brian W. S.; Ripplinger, Miriam P.; Wooster, Jeffrey J.; Chum, Pak-Wing S.; and deCroot, Jacquelyn A., 5,487,938, Cl. 428-332.000.
Komatsubara, Saburo: *See*—
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Komatsuzaki, Hiroshi: *See*—
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Komori, Noboru; Kato, Yoshiaki; and Umekida, Masaru, to Fuji Photo Film Co., Ltd. Magnetic head including a magnetic recording medium slide surface with predetermined dimensions. 5,488,527, Cl. 360-122.000.
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Kondo, Shigeki: *See*—
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Kondo, Shinichi; Shibahara, Seiji; Usui, Takayuki; Kudo, Toshiaki; Gomi, Shuichi; Tamura, Atsushi; Ikeda, Yoko; Ikeda, Daishiro; and Takeuchi, Tomio, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Dibekacin derivatives and arbekacin derivatives active against resistant bacteria. 5,488,038, Cl. 514-41.000.
Kondo, Tetsujiro; and Nakaya, Hideo, to Sony Corporation. Error detecting apparatus. 5,488,618, Cl. 371-67.100.
Köngeter, Herbert: *See*—
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Konica Corporation: *See*—
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König, Klaus: *See*—
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Koome, Eric: *See*—
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Korall, Menachem; Harats, Yehuda; Dechovich, Boris; Goldstein, Jonathan R.; and Koretz, Binyamin, to Electric Fuel (E.F.L.) Ltd. Cooled zinc-oxygen battery. 5,487,955, Cl. 429-26.000.
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Uhm, Sung J.; Han, Song H.; Oh, Jun W.; and Joo, Oh S., 5,488,143, Cl. 560-232.000.
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Koshigoe, Taichi; Satoh, Hitoshi; and Yamamoto, Kenichi, to Nippon Kayaku Kabushiki Kaisha. Process for producing optically active erythro-3-amino-1,2-epoxy compound. 5,488,118, Cl. 549-518.000.
Koshiishi, Eiichi, to Horiuchi Co., Ltd. Snowkrel. 5,487,379, Cl. 128-201.110.
Koshika, Norihide: *See*—
Sakamoto, Mitsuo; Koshika, Norihide; Nishimura, Isao; Sasaki, Katsuyasu; and Ouraf, Satoshi, 5,487,534, Cl. 267-141.100.
Kosmehl, Gerhard; and Lundt, Bettina, to Dainippon Ink and Chemicals, Inc. Stiff-chain polyesters and a method of preparing them. 5,488,093, Cl. 528-193.000.
Kosson, Robert: *See*—
Malik, Paul; Kosson, Robert; Vasely, Michael; and Stegmann, George, 5,488,642, Cl. 376-272.000.
Kotabe, Noriko: *See*—
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Kourbatov, Vladimir A.; Borzyko, Natalfya P.; Zouev, Valerii P.; and Liakumovich, Alexandr G., to Kourbatov. Method for inhibiting the polymerization of styrene. 5,488,192, Cl. 585-435.000.
Kovacs, Joseph. Composition of dehydrated powdered mung bean sprout and plant fiber for use as dietary supplement in healthcare. 5,487,894, Cl. 424-195.100.
Kowalcyk, Thomas M.: *See*—
Barrett, David W.; McHugh, Thomas M.; Ahigian, Edward E.; Jaminet, Jerome F.; He, Thomas; Peruggi, Richard E.; Kowalcyk, Thomas M.; and Kulak, Richard E., 5,487,449, Cl. 187-330.000.
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Kozulla, Randall E., to Hercules Incorporated. Multiconstituent fibers, and nonwoven structures of such fibers. 5,487,943, Cl. 428-373.000.
Kraft Foods, Inc.: *See*—
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Krajenbrink, Frans G.: *See*—
Nieh, Simon K.; Matossian, Jesse N.; Krajenbrink, Frans G.; and Schumacher, Robert W., 5,487,922, Cl. 427-528.000.
Kramer, Hy. Protection device for apertures in metal studs or panels. 5,488,198, Cl. 174-48.000.
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Kyuma, Kenji, to Canon Kabushiki Kaisha. Image sensing method and apparatus in which the exposure time may be varied. 5,488,416, Cl. 348-296.000.
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Labudde, Brian R.; and Hacknauer, Frank, to Eastman Kodak Company. Operator control interface mounting mechanism. 5,488,453, Cl. 355-202.000.
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Ladouceur, Harold A., to Multifastener Corporation. Self-adjusting head. 5,487,215, Cl. 29-702.000.
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Landgren, Robert; and Perenchio, William F., to Kalman Floor Company, Inc. Method and apparatus for testing concrete expansion. 5,487,307, Cl. 73-803.000.
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Langreck, Gerald K., to Marquip, Inc. Adaptive control of a multiphase induction motor having concentrated phase windings. 5,488,280, Cl. 318-805.000.
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Lassiter, Keith R. Motorcycle circuit breaker ignition advance. 5,487,367, Cl. 123-420.000.
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Laurain, Jean-Marie; DeWald, Ronald L.; D'Amore, Jean-François; and Deneuvillers, Guy, to Sofamore, S.N.C. Anterior dorso-lumbar spinal osteosynthesis instrumentation for the correction of kyphosis. 5,487,743, Cl. 606-61.000.
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Ozeki, Masamichi; Takasaki, Mamoru; Miyamoto, Katsuyuki; and Tsuruda, Mitsumasa, 5,487,252, Cl. 53-212.000.
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Lavorgna, Blaise; and Sebastian, Peter R. Swimmer's drag suit having detachable and repositionable pockets. 5,487,710, Cl. 482-55.000.
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McDow, Timothy S.; and Bensinger, Marlin, 5,487,871, Cl. 422-80.000.
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Le Blevec, Jean-Marc; Correia, Yves; Masini, Jean-Jacques; Bousquet, Jacques; and Bergougnou, Maurice A., to Elf Atochem S.A. Prepartion of vinyl chloride by ultrapyrolysis of 1,2-dichloroethane. 5,488,190, Cl. 570-226.000.
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Lechner, Robert J.; and Streid, Harold R., to McDonnell Douglas Corporation. Video display system and method for generating and individually positioning high resolution inset images. 5,487,665, Cl. 434-44.000.
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Kim, Jung H.; Chung, Hae Y.; Kim, Hyung S.; Lee, Byeong H.; and Roh, Young H., 5,487,284, Cl. 68-3.0SS.
Lee, Byung C., to Goldstar Co. Ltd. Axial leakage resistant apparatus of scroll-type compressor. 5,487,653, Cl. 418-14.000.
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Lee, Fang-Jen S.: *See*—
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Lee, Myeong-hwan: *See*—
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Lee, Seung-Soo. Safety device for novelty candle holders. 5,487,658, Cl. 431-253.000.
Lee, Stanley M.: *See*—
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Lee, Tien-Yu T.: *See*—
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LeMay, Edward J. Enhanced depth perception viewing device for television. 5,488,510, Cl. 359-478.000.
Lemke, James U.; and French, William W., to Conner Peripherals, Inc. Information recording apparatus with a non-newtonian liquid bearing. 5,488,521, Cl. 360-97.020.
Lempel, Abraham: *See*—
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Leonhardt, Helga P. Dynamic language training system. 5,487,670, Cl. 434-167.000.
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Leppard, David G.; Burdeska, Kurt; and Slongo, Mario, to Ciba-Geigy Corporation. Triazine compounds as UV absorbers for photographic material. 5,488,108, Cl. 544-216.000.
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Leuthold, Hans; Jennings, David J.; Clark, Wesley R.; Khan, Raquib; and Heine, Guenther, to Seagate Technology, Inc. Single plate hydrodynamic bearing with self-balancing fluid level and fluid circulation. 5,487,608, Cl. 384-113.000.

Lever Brothers Company, Division of Conopco, Inc.: *See*—
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Gutierrez, Eddie N.; and Wu, Shang-Ren, 5,488,146, Cl. 562-109.000.

Levinson, Gary. Tracheal tube cuff inflation control and monitoring system. 5,487,383, Cl. 128-207.150.

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Scott, Curtis E.; Kaliszewski, Mary Sue; and Levinson, Lionel M., 5,487,353, Cl. 117-4.000.

Lewis, Scott W., to Multimedia Systems Corporation. Interactive system for a closed cable network. 5,488,411, Cl. 348-8.000.

Lewis, Thomas E.; Nowak, Michael T.; Robichaud, Kenneth T.; and Cassidy, Kenneth R., to Presstek, Inc. Lithographic printing plates for use with laser-discharge imaging apparatus. 5,487,338, Cl. 101-454.000.

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Lextron, Inc.: *See*—
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LG Industrial Systems Co., Ltd.: *See*—
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Li, Jinglin: *See*—
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Li, Sidong: *See*—
Singhal, Dave M.; and Li, Sidong, 5,488,385, Cl. 345-3.000.

Li, Yang R. Speedometer capable of providing real-time speed pulse signals. 5,487,303, Cl. 73-499.000.

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Liddell, Peter A.; Mueller, Douglas L.; and Wohlers, Gary L., to Honeywell Inc. Magnetic sensor with means for retaining a magnet at a precise calibrated position. 5,488,294, Cl. 324-207.210.

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Liebermensch, Avi: *See*—
MacWilliams, Peter D.; Avni, Dror; Liebermensch, Avi; Baransy, Anan; and Farrell, Robert L., 5,488,639, Cl. 375-355.000.

Liebram, Udo: *See*—
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Lietz, Hans: *See*—
Reichert, Günther; Lietz, Hans; Hassdenteufel, Jürgen-Rolf; Sackmann, Günter; and Kobelka, Frank, 5,487,964, Cl. 430-16.000.

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Heller, Donald F.; Chin, Timothy C.; and Krasinski, Jerzy S., 5,488,626, Cl. 372-70.000.

Liimatta, Eric W.: *See*—
Hu, Patrick C.; and Liimatta, Eric W., 5,487,882, Cl. 423-700.000.

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Beacham, William H., Jr.; and Lillestolen, Erik C., 5,488,323, Cl. 327-74.000.

Limaye, Santosh Y. Ultra low thermal expansion, highly thermal shock resistant ceramic. 5,488,018, Cl. 501-104.000.

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Hale, Joseph F.; and Burgardt, Jeffrey, 5,487,243, Cl. 52-202.000.

Lin, John: *See*—
Weerasooriya, Upali; Lin, John; Matheson, K. Lee; Robertson, Donald T.; Watson, Janet L.; and Rowe, LeAnn M., 5,488,148, Cl. 562-123.000.

Lin, Lee-Wen: *See*—
Smith, John A.; Lee, Fang-Jen S.; and Lin, Lee-Wen, 5,487,990, Cl. 435-172.300.

Lin, Ran-Jin, to Industrial Technology Research Institute. Process for making high temperature superconducting oxide films. 5,488,031, Cl. 505-475.000.

Lindahl, Lars: *See*—
Stillbäck, Ola; and Lindahl, Lars, 5,487,685, Cl. 439-801.000.

Lindenman, Charles E.: *See*—
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Lindsay, Bruce G.: *See*—
Agrawal, Rakesh; De Michiel, Linda G.; and Lindsay, Bruce G., 5,488,727, Cl. 395-700.000.

Link, Donald A.: *See*—
Hubbard, Dean A.; Link, Donald A.; and Hunter, David S., 5,488,337, Cl. 335-202.000.

Link Group International: *See*—
Simmel, Thomas L.; McDarren, Robert S.; and Truchsess, Joseph, 5,487,925, Cl. 428-19.000.

Little, Oscar L. Lower leg exercise device and method. 5,487,711, Cl. 482-79.000.

Littlefield, James A.: *See*—
Brown, Eric W.; and Littlefield, James A., 5,488,368, Cl. 341-119.000.

Litton Systems, Inc.: *See*—
Gourse, Stanley J.; Fischer, Eugene; and Harrison, George A., 5,488,313, Cl. 324-754.000.
Michal, Ronald J.; and Torres, Fernando, 5,488,683, Cl. 385-98.000.
Mitchell, Robert A., 5,488,622, Cl. 372-33.000.
Targove, James D., 5,488,371, Cl. 342-1.000.

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Lo, Tin-chee, to International Business Machines Corporation. Latch interface for self-reset logic. 5,488,319, Cl. 326-115.000.

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Casada, Donald A.; Haynes, Howard D.; Moyers, John C.; and Stewart, Brian K., 5,487,302, Cl. 73-168.000.

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Friedman, Arnold; Ribble, William; and Wade, William D., 5,488,383, Cl. 343-912.000.

Lockshaw, James J.; Kelly, Stephen; Walker, Randall; and Kaiser, John, Jr., to Tolo, Inc. Three structure structural element with interlocking ribbing. 5,487,930, Cl. 428-53.000.

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Jenkins, Richard D.; Bassett, David R.; Smith, Danny E.; Argyropoulos, John N.; Loftus, James E.; and Shay, Gregory D., 5,488,180, Cl. 568-609.000.

Lokhoff, Gerardus C. P.: *See*—
Dewolf, Jan; Lokhoff, Gerardus C. P.; and Hoogendoorn, Abraham, 5,488,663, Cl. 380-49.000.

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Long, John M.: *See*—
McKee, Mark P.; Zapisek, John; Bulfer, David M.; Long, John M.; Nickolls, John R.; and Blank, William T., 5,488,694, Cl. 395-824.000.

Long, Stephen I.: *See*—
Fenzi, Neal O.; and Long, Stephen I., 5,488,382, Cl. 343-700.00R.

Longo, Antonio: *See*—
Buzzetti, Franco; Longo, Antonio; and Colombo, Maristella, 5,488,057, Cl. 514-312.000.

Lonza Ltd.: *See*—
Hardt, Peter; Daum, Ulrich; and Völker, Theodor, 5,488,163, Cl. 564-315.000.

Lopata, Eugene S.; and Nakanishi, John S., to BOC Group, Inc., The. Process for plasma-enhanced chemical vapor deposition of anti-fog and anti-scratch coatings onto various substrates. 5,487,920, Cl. 427-489.000.

Lord Corporation: *See*—
Halladay, James R., 5,488,081, Cl. 524-314.000.
Sweeney, Eugene J.; and Pelts, Gregory A., 5,487,803, Cl. 156-91.000.

Lorsbach, Thomas W.: *See*—
Kulprathipanja, Santi; Maher, Gregory F.; and Lorsbach, Thomas W., 5,488,156, Cl. 562-580.000.

Lossa, Ulrich: *See*—
Scheufeld, Heinz; Lossa, Ulrich; and Stenmans, Heinz, 5,487,263, Cl. 57-58.860.

Lovejoy, Michael W., to Minnesota Mining and Manufacturing Company. High intensity peening flaps with fastener, and wheels incorporating same. 5,487,293, Cl. 72-53.000.

Lowe, Bryan K.: *See*—
Poison, Alan M.; Swanbom, Deryl D.; Dunn, Richard L.; Cox, Charles P.; Norton, Richard L.; Lowe, Bryan K.; and Peterson, Kenneth S., 5,487,897, Cl. 424-426.000.

Lowman, Richard M., Jr.: *See*—
Drummond, Michael T.; Hill, Calvin G.; Lowman, Richard M., Jr.; Suski, William C.; Roberts, Rodney W.; and Lowry, James W., 5,487,506, Cl. 229-202.000.

Lowry, James W.: *See*—
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Lu, Chien-Te: *See*—
Yang, Ming-Sheng; Cherng, Yu-Show; and Lu, Chien-Te, 5,487,485, Cl. 220-403.000.

Lu, Hui-Lan: *See*—
Kaplan, Marc P.; Lu, Hui-Lan; and Slutsman, Lev, 5,488,569, Cl. 364-514.00R.

Lu, Mou-Ying F.; and Reiland, Thomas L., to Abbott Laboratories. Compositions and method for the sublingual or buccal administration therapeutic agents. 5,487,898, Cl. 424-435.000.

Lubrizol Corporation, The: *See—*
Luciani, Carmen V.; and Rizvi, Syed Q. A., 5,487,838, Cl. 252-49.900.
Vinci, James N.; Rizvi, Syed Q. A.; and Luciani, Carmen V., 5,487,839, Cl. 252-49.900.

Lucardie, John F. Baseball card storage and protection device. 5,487,601, Cl. 312-183.000.

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Bayliss, John P.; and Byrnes, Sean, 5,487,325, Cl. 91-376.00R.

Lucas Industries Public Limited Company: *See—*
Schlüter, Peter; and Zeuner, Lothar, 5,487,327, Cl. 92-128.000.

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Vinci, James N.; Rizvi, Syed Q. A.; and Luciani, Carmen V., 5,487,839, Cl. 252-49.900.

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Kim, Sung-Hou; and Cho, Joong M., 5,487,983, Cl. 435-69.100.

Ludden, Michael J.; Penneck, Richard J.; and Smith, Nicholas J. G., to Raychem Limited. Laser-machining polymers. 5,487,852, Cl. 264-400.000.

Ludwig Institute for Cancer-Research: *See—*
Boon-Falleur, Thierry; Brichard, Vincent; Van Pel, Aline; De Plaen, Etienne; Coulie, Pierre; Renauld, Jean-Christope; Wölfel, Thomas; and Lethé, Bernard, 5,487,974, Cl. 435-6.000.

Ludwig, Michael; Reber, Rolf; and Feldle, Heinz-Peter, to Deutsche Aerospace AG. Constant current source. 5,488,328, Cl. 327-538.000.

LUK Lamellen und Kupplungsbau GmbH: *See—*
Friedmann, Oswald; and Jäckel, Johann, 5,487,704, Cl. 464-24.000.

Luken, Patrick C.: *See—*
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Luken, William L.: *See—*
Gharachorloo, Nader; and Luken, William L., 5,488,684, Cl. 395-123.000.

Lumpkin, Everett R.: *See—*
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Lunar Corporation: *See—*
Knutson, Joyce C.; Bishop, Charles W.; and Moriarty, Robert M., 5,488,120, Cl. 552-653.000.

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Lundt, Bettina: *See—*
Kossmehl, Gerhard; and Lundt, Bettina, 5,488,093, Cl. 528-193.000.

Lürssen, Klaus: *See—*
Haas, Wilhelm; Müller, Klaus-Helmut; König, Klaus; Santel, Hans-Joachim; Lürssen, Klaus; and Schmidt, Robert R., 5,488,028, Cl. 504-193.000.

Lynd, Laurence J.: *See—*
Sharf, Lucille M.; Lynd, Laurence J.; Smith, James F.; and Schlueter, Edward L., Jr., 5,487,707, Cl. 474-253.000.

Lynn, Dwight D.; Reid, Kirk A.; and Chen, Shu-Ren, to ACS Communications, Inc. Apparatus for and method of operating an automatic log on/log off circuit in a telephone system by disconnecting a headset. 5,488,657, Cl. 379-395.000.

Lyon, Sue B.; O'Neal, Clifford; Van Der Lee, Hermes; and Rogers, Brian, to Gillette Company, The. Amino acid β-lyase enzyme inhibitors as deodorants. 5,487,886, Cl. 424-65.000.

M L Aviation Limited: *See—*
Rhodes, Glenn M., 5,487,322, Cl. 89-1.560.

MacCarter, Dean J.; Hopper, Don; Cooper, Daniel; and Hassell, Roger, to Telectronics Pacing Systems, Inc. Rate-responsive pacemaker with anaerobic threshold adaptation and method. 5,487,753, Cl. 607-017.000.

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Nakamori, Tomohiro; Hashimoto, Hiroshi; Endo, Soya; Machino, Hitoshi; and Ishizu, Masanori, 5,488,625, Cl. 372-50.000.

Mack, Henry J. Stowaway table. 5,487,342, Cl. 108-42.000.

Mackay, Bruce W.; and Arian, Abbas, to Westers Atlas International Inc. Core separator assembly. 5,487,433, Cl. 175-78.000.

Mackerer, Carl R.; Roy, Timothy A.; and Blackburn, Gary R., to Mobil Oil Corporation. Process for reducing polynuclear aromatic mutagenicity by alkylation. 5,488,193, Cl. 585-455.000.

MacMillan Bloedel Limited: *See—*
Barnes, Derek, 5,487,460, Cl. 198-382.000.

MacWilliams, Peter D.; Avni, Dror; Liebermensch, Avi; Baransy, Anan; and Farrell, Robert L., to Intel Corporation. Parallel multistage synchronization method and apparatus. 5,488,639, Cl. 375-355.000.

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Madden, Peter G.: *See—*
Zytka, Donald J.; Madden, Peter G.; and Eglinton, Robert B., 5,487,768, Cl. 55-385.200.

Madurawe, Raminda; and Schmidt, Dominik, to Altera Corporation. Method and apparatus for erasing an array of electrically erasable programmable read only memory cells. 5,488,586, Cl. 365-218.000.

Maduzia, Kenneth S.; Frett, Kenneth J.; and Vitt, James J., to A.C. Nielsen Company. Serial data channel metering attachment for metering channels to which a receiver is tuned. 5,488,408, Cl. 348-2.000.

Maeda, Hiroshi; and Omori, Takuro, to Sharp Kabushiki Kaisha. Method for driving display device. 5,488,387, Cl. 345-89.000.

Maekawa, Hiromi: *See—*
Wakabayashi, Naoto; Tsuchiko, Masayoshi; Akama, Terufumi; Maekawa, Hiromi; Shikata, Hiroyuki; Yamazaki, Nobuo; and Kawaguchi, Tomio, 5,487,386, Cl. 128-660.010.

Maemoto, Kazuo: *See—*
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Magee, Thomas V.: *See—*
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Maggi, Lauretta: *See—*
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Magnetek, Inc.: *See—*
Bauer, Fred P.; Sanders, Stuart E.; Van Wagener, Raymond H.; and Opperthauser, Mark R., 5,488,268, Cl. 315-70.000.

Magnuson, Larry R.: *See—*
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Magnuson, Roy H.: *See—*
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Mahabadi, Hadi K.; Wright, Denise Y.; Cunningham, Michael F.; and Creatura, John A., to Xerox Corporation. Process for the preparation of conductive polymeric particles with linear and crosslinked portions. 5,487,847, Cl. 252-511.000.

Mahant-Shetti, Shivaling S.; Agarwala, Manisha; Mehendale, Mahesh M.; Landers, Robert J.; and Harward, Mark G., to Texas Instruments Incorporated. Adder-based base cell for field programmable gate arrays. 5,488,315, Cl. 326-37.000.

Maher, Gregory F.: *See—*
Kulprathipanja, Santi; Maher, Gregory F.; and Lorsbach, Thomas W., 5,488,156, Cl. 562-580.000.

Main, David R., to 3DO Company, The. Amplitude adaptive filter. 5,488,576, Cl. 364-724.010.

Maina, Bruno, to Roj Electrotex S.p.A. Weft feeder with rethreading and braking devices. 5,487,415, Cl. 139-452.000.

Majeti, Venkata C.; Midani, Mowaffak T.; Watson, Richard J.; and Zabriskie, Kenneth A., to AT&T Corp. Customer premises equipment receives high-speed downstream data over a cable television system and transmits lower speed upstream signaling on a separate channel. 5,488,412, Cl. 348-10.000.

Major, Miklos, to Microsonic, Inc. Hearing aid tubing connector. 5,488,205, Cl. 181-129.000.

Makishima, Tatsuo: *See—*
Yamagishi, Toshio; Nanba, Masakazu; Egami, Norifumi; Tanioka, Kenkichi; Kurashige, Mitsuhiro; Tsuji, Kazutaka; Kaneko, Yoshiyuki; Makishima, Tatsuo; Nagatsuma, Kazuyuki; Ohshima, Tetsuya; and Nakano, Yasushi, 5,488,386, Cl. 345-74.000.

Makita Corporation: *See—*
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Makita, Shigeru; Sano, Yoshihiko; Nakamura, Yasushi; and Ota, Hiroyuki, to Omron Corporation. Radiation clinical thermometer. 5,487,607, Cl. 374-158.000.

Maksim, James E., to Precision Technologies, Inc. Lead conditioning system for semiconductor devices. 5,487,416, Cl. 140-105.000.

Maley, Dale C.; and Tharp, Dwayne E., to Caterpillar Inc. Hard magnetic valve actuator adapted for a fuel injector. 5,488,340, Cl. 335-253.000.

Malik, Paul; Kosson, Robert; Vasely, Michael; and Stegmann, George, to Consolidated Edison Company of New York, Inc.; and Vasely, Michael. Cooling system for spent fuel pool. 5,488,642, Cl. 376-272.000.

Malik, Randhir S., to International Business Machines Corporation. Pulse width modulated power supply which avoids excessive on-time of switch during start-up. 5,488,551, Cl. 363-20.000.

Mallik, Debendra: *See—*
Bhattacharyya, Bidyut; and Mallik, Debendra, 5,488,257, Cl. 257-774.000.

Mallinson, Steven M.; and McAleavey, Michael E. Apparatus and method for continuous synthesis of vanadium oxide. 5,487,876, Cl. 422-205.000.

MAN Roland Druckmaschinen AG: *See—*
Simeth, Claus, 5,487,336, Cl. 101-216.000.

Mandeville, W. Harry, III; and Holmes-Farley, Stephen R., to GelTex, Inc. Iron-binding polymers for oral administration. 5,487,888, Cl. 424-78.100.

Mandzy, John; and Degler, David S., to Martin Marietta Corporation. Safety bag inflation apparatus using a liquid propellant gas generator. 5,487,561, Cl. 280-741.000.

Manitowoc Company, Inc., The: *See—*
Pech, David J.; Walker, Robert J.; and Wanek, Michael J., 5,487,479, Cl. 212-270.000.

Mann, Brian M.: *See—*
Snell, Jeffery D.; Schloss, Harold C.; Mann, Brian M.; Poore, John W.; and Medlin, Roy B., 5,487,754, Cl. 607-27.000.
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Mannesmann Aktiengesellschaft: *See—*
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Kemner, Axel; Keschwari, Mahmud; and Zeller, Peter K., 5,488,287, Cl. 322-20.000.
Manning, Mark C.: *See*—
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Mano, Hiroshi: *See*—
Ojima, Masaki; Ohkubo, Masaharu; Itoh, Michio; Sasame, Hiroshi; Yamada, Hiromichi; Saito, Tetsuo; Kashihara, Atsushi; Kawana, Takashi; Mano, Hiroshi; Seto, Kaoru; and Atobe, Hiroshi, 5,488,487, Cl. 358-456.000.
Mansfield, Daniel; Bell, Ian; Buehring, Ian; and Harding, Jennifer, to Rank Taylor Hobson Limited. Apparatus and method using optical diffraction to measure surface roughness. 5,488,476, Cl. 356-354.000.
Marazzo, Joseph; Russo, Frank; Palmer, Michael G.; and Hartmann, Gary L., to Brooklyn Union Gas. Material transfer apparatus and method. 5,487,228, Cl. 37-317.000.
Marcadis, Stuart J.; and Devries, James H., to Medtronic, Inc. Balloon catheter with balloon surface retention means. 5,487,730, Cl. 604-96.000.
March, Carl J.: *See*—
Dower, Steven K.; March, Carl J.; Sims, John E.; and Urdal, David L., 5,488,032, Cl. 514-2.000.
Marchek, Kyle J.; and McClelland, Timothy R., to Molex Incorporated. Packaging container assembly for electrical connector components. 5,487,471, Cl. 206-725.000.
Marchionni, Giuseppe; Guarda, Pier A.; and Paganin, Maurizio, to Ausimont S.p.A. Process for preparing perfluoropolyethers. 5,488,181, Cl. 568-615.000.
Marchuk, Jeffrey P.: *See*—
Guzik, Andrzej T.; Smith, Todd L.; and Marchuk, Jeffrey P., 5,487,674, Cl. 439-83.000.
Marentes, Faustin T.; and Monasterio, Jorge, to RJS, Inc. Laser printer paper handling system. 5,488,467, Cl. 355-282.000.
Marin, Constantin: *See*—
Wood, John R.; and Marin, Constantin, 5,488,560, Cl. 364-148.000.
Marion, Michael P.; and Otto, David C., to Du Pont de Nemours, E. I., and Company. Pre-proof temperature controlling assembly. 5,487,801, Cl. 156-64.000.
Markovich, Voya R.: *See*—
Bhatt, Anilkumar C.; Magnuson, Roy H.; Markovich, Voya R.; Papathomas, Konstantinos I.; and Powell, Douglas O., 5,487,218, Cl. 29-852.000.
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Marlin Firearms Company, The: *See*—
Osborne, William E.; Waterman, Harold J., Jr.; and Findlay, David, 5,487,232, Cl. 42-51.000.
Marmonier, Gilles, to Skis Rossignol S.A. Ski boot with a collar having a closure slide. 5,487,227, Cl. 36-117.000.
Marquart, Bernd: *See*—
Brandt, Wolfram; Marquart, Bernd; and Stoehr, Roland R., 5,488,314, Cl. 324-758.000.
Marquip, Inc.: *See*—
Langreck, Gerald K., 5,488,280, Cl. 318-805.000.
Marquis, Edward T.: *See*—
Knifton, John F.; Marquis, Edward T.; and Dai, Pei-Shing E., 5,488,178, Cl. 568-578.000.
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Marschall, Christian: *See*—
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Marschner, Claus; and Patsch, Manfred, to BASF Aktiengesellschaft. Formazan-based reactive dyes with at least two reactive groups, and aminophenols. 5,488,100, Cl. 534-618.000.
Marschner, Claus; and Patsch, Manfred, to BASF Aktiengesellschaft. Aminophenols useful as intermediates for formazan reactive dyes. 5,488,127, Cl. 558-25.000.
Marshall, Jeremy; and Crossman, David D., to Owen Mumford Limited. Blood sampling device. 5,487,748, Cl. 606-182.000.
Marshall, Stephen W.: *See*—
Gove, Robert J.; Doherty, Donald B.; Heimbuch, Scott D.; Urbanus, Paul M.; and Marshall, Stephen W., 5,488,431, Cl. 348-716.000.
Martel, Ralph R.: *See*—
Miller, Phillip C.; Druyor, Roberta L.; and Martel, Ralph R., 5,487,975, Cl. 435-7.500.
Martherus, William A.: *See*—
Hilleveld, Jerry; Martherus, William A.; and Hartman, Kenneth J., 5,487,278, Cl. 62-236.000.
Martin, Bill, Jr. Security device for buildings. 5,487,237, Cl. 49-57.000.
Martin, Daniel T.: *See*—
Hutchinson, William R.; and Martin, Daniel T., 5,487,769, Cl. 55-442.000.
Martin Marietta Corporation: *See*—
Mandzy, John; and Degler, David S., 5,487,561, Cl. 280-741.000.
Williams, Laurence O., 5,487,798, Cl. 149-22.000.
Worchesky, Terrance L.; and Ritter, Kenneth J., 5,488,504, Cl. 359-248.000.
Martin Marietta Magnesia Specialities Inc.: *See*—
Witkowski, Joseph T.; Smith, David M.; and Wajer, Mark T., 5,487,879, Cl. 423-155.000.
Martin, Robert D. Cleaning device that does not engage the disc drive spindle. 5,488,596, Cl. 369-71.000.
Martin, Thomas W.; Simpson, William H.; and Hastreiter, Jacob J., Jr., to Eastman Kodak Company. Dye-receiving element containing elastomeric beads in overcoat layer for thermal dye transfer. 5,488,025, Cl. 503-227.000.
Martinez Velazquez, Manuel J. System for facilitating an oil change and/or an oil filter change in internal combustion engines. 5,487,447, Cl. 184-1.500.
Martinovich, Krsman; and Beyer, Donald R. Method and apparatus for secure programming of communication radios. 5,488,356, Cl. 340-825.220.
Maru, Saburo: *See*—
Takada, Kunio; Otani, Kenji; Yamada, Masayuki; Maru, Saburo; Sudo, Sumio; and Tanaka, Sadashi, 5,487,621, Cl. 405-52.000.
Marusue, Toshihisa, to Mazda Motor Corporation. Automatic transmission control system for automobiles. 5,487,708, Cl. 475-116.000.
Maruyama, Shigeru; Shimasaki, Yuichi; Kanehiro, Masaki; Hisaki, Takashi; Baba, Shigeki; Ishioka, Takuji; Takagi, Jiro; and Akiyama, Eitetsu, to Honda Giken Kogyo Kabushiki Kaisha. Spark plug cap with ignition voltage detective capacitor for internal combustion engine. 5,487,676, Cl. 439-125.000.
Maruyama, Yu; Taguchi, Yoshu; and Hayano, Kijuro, to Taguchi Medical Co., Ltd. Bone plate. 5,487,741, Cl. 606-60.000.
Mas-Hamilton Group: *See*—
Dawson, Gerald L.; and Thompson, Daniel L., 5,488,660, Cl. 380-24.000.
Hamilton, James E.; Dawson, Gerald L.; and Thompson, Daniel L., 5,488,358, Cl. 340-825.310.
Masbach, Bernd: *See*—
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Masghati, Mohammad; and Cline, Jack R., to Illinois Tool Works Inc. Arc suppressor for sidactors. 5,488,535, Cl. 361-119.000.
Masini, Jean-Jacques: *See*—
Le Blevec, Jean-Marc; Correia, Yves; Masini, Jean-Jacques; Bousquet, Jacques; and Bergougnou, Maurice A., 5,488,190, Cl. 570-226.000.
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Furumiya, Shigeru; and Takemura, Yoshinari, 5,488,593, Cl. 369-32.000.
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Sedberry, Donald C., 5,488,394, Cl. 346-141.000.

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Hoffner, Max, 5,487,677, Cl. 439-293.000.

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Mallinson, Steven M.; and McAleavey, Michael E., 5,487,876, Cl. 422-205.000.

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Simmel, Thomas L.; McDarren, Robert S.; and Truchsess, Joseph, 5,487,925, Cl. 428-19.000.

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Vo, Huy T.; and Mclaury, Loren L., 5,488,584, Cl. 365-203.000.

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Brach, Philip L., Jr.; Khalil, Charles; and Mead, Robert W., 5,487,203, Cl. 15-245.000.

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Marcadis, Stuart J.; and Devries, James H., 5,487,730, Cl. 604-96.000.

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Reiffenrath, Volker; Kurmeier, Hans A.; Poetsch, Eike; Plach, Herbert; Finkenzeller, Ulrich; Bartmann, Ekkehard; Krause, Joachim; and Scheuble, Bernhard, 5,487,845, Cl. 252-299.630.
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Farwer, Alfward, 5,488,216, Cl. 219-121.640.
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Monzyk, Bruce F., 5,487,842, Cl. 252-60.000.
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Hewitt, Kent D.; Alexander, Samuel E.; and Fisher, Richard J., 5,488,711, Cl. 395-430.000.
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Major, Miklos, 5,488,205, Cl. 181-129.000.
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Schedegger, Charles E.; Allen, Clyde G.; Clark, Michael C.; Nurenberg, Aundrea; and Wnuk, Jack, 5,487,701, Cl. 454-271.000.
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Oyen, Margaret A.; and Baldwin, Linda, 5,487,668, Cl. 434-98.000.
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Ueda, Tomohiro; Iotow, Takashi; Asamura, Yoshinori; Onishi, Ken; and Mishima, Hidetoshi, 5,488,482, Cl. 358-339.000.

Mishima, Naoshi: *See*—
Tamura, Hiroshi; Fukagai, Toshio; Mishima, Naoshi; and Sasaki, Masaomi, 5,488,137, Cl. 560-141.000.

Mistry, Balwantrai; and Wallace, Raymond B., to Northern Telecom Limited. VME bus compatible backplane and shelf arrangement. 5,488,541, Cl. 361-788.000.

Mita, Yoshinobu, to Canon Kabushiki Kaisha. Color image processing apparatus. 5,488,672, Cl. 382-167.000.

Mitchell, Robert A., to Litton Systems, Inc. Simplified dispersion equalization field coil design for a multioscillator ring laser gyroscope. 5,488,622, Cl. 372-33.000.

Mitomi, Tatsuo; Aoki, Tomohiro; Murayama, Yasushi; Uchida, Takashi; Kobayashi, Tohru; Ikkatai, Masatoshi; and Nemura, Masaharu, to Canon Kabushiki Kaisha. Belt driving apparatus and image recording apparatus using the same. 5,488,399, Cl. 347-43.000.

Mitsubishi Chemical Corporation: *See*—
Takahashi, Tadashi; Fujita, Takashi; Nakamura, Kazuo; and Tsukamoto, Seiichi, 5,488,022, Cl. 502-115.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Harada, Shigeru; Arima, Junichi; and Fujiki, Noriaki, 5,488,014, Cl. 437-192.000.
Hayashide, Yoshio; and Tsujita, Kouichirou, 5,488,246, Cl. 257-336.000.
Ikeda, Mutsumi, 5,488,564, Cl. 364-474.160.
Kojima, Kazuaki; Kuno, Tetsuya; Sugiura, Hiroaki; and Yamada, Takeshi, 5,488,429, Cl. 348-653.000.
Matsui, Mitsuru, 5,488,661, Cl. 380-29.000.
Matsuoka, Hiroshi, 5,488,253, Cl. 257-622.000.
Mishima, Hidetoshi; and Itow, Takashi, 5,488,418, Cl. 348-398.000.
Nagao, Masashi, 5,487,272, Cl. 62-6.000.
Sakurai, Mikio, 5,488,247, Cl. 257-368.000.
Shimizu, Masahiro; Shirahata, Masayoshi; Kuroi, Takashi; and Yamaguchi, Takehisa, 5,488,245, Cl. 257-316.000.
Shirota, Shozo, 5,488,006, Cl. 437-43.000.
Takemura, Taketoshi; Sakurwa, Makoto; and Watanuki, Haruo, 5,488,263, Cl. 313-402.000.
Takita, Hidenori; and Hirakawa, Tatsuhiro, 5,488,270, Cl. 315-370.000.
Ueda, Tomohiro; Iotow, Takashi; Asamura, Yoshinori; Onishi, Ken; and Mishima, Hidetoshi, 5,488,482, Cl. 358-339.000.
Yamada, Akira, 5,488,578, Cl. 365-49.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Kawakami, Yoshinaka; Takigawa, Yoshiharu; Isomura, Arihiro; Kamiya, Kouichi; and Hamatani, Katsunori, 5,488,353, Cl. 340-576.000.

Mitsubishi Materials Corporation: *See*—
Kanatani, Hiroshi; Koyama, Takao; Hashimoto, Kouji; and Adachi, Yutaka, 5,487,627, Cl. 408-145.000.

Mitsubishi Plastics, Inc.: *See*—
Kakishita, Osamu; Nishioka, Jun; Fujita, Takeshi; and Matsuo, Katsuaki, 5,487,947, Cl. 428-424.400.

Mitsumura, Tadayasu: *See*—
Shigetoh, Nobuyuki; Miyazaki, Jipsei; Nakayama, Hiroshi; Yugawa, Keiko; and Mitsumata, Tadayasu, 5,488,114, Cl. 548-510.000.

Mitsunori, Hiromi; and Sadayori, Toshio, to Kawasaki Steel Corporation. Method of producing crystal bodies having controlled crystalline orientation. 5,487,794, Cl. 148-111.000.

Mitsuya, Morihiro: *See*—
Nomoto, Takashi; Hayashi, Masahiro; Shibata, Jun; Iwasawa, Yoshikazu; Mitsuya, Morihiro; Iida, Yoshiaki; Noncshita, Katsumasa; and Nagata, Yasufumi, 5,488,149, Cl. 562-449.000.

Mitsuyu, Tsuneo: *See*—
Yoshii, Shigeo; Okawa, Kazuhiro; Tsujimura, Ayumi; and Mitsuyu, Tsuneo, 5,488,234, Cl. 257-94.000.

Miura, Shunichi: *See*—
Muruta, Satoru; Kawabata, Atsushi; Miura, Shunichi; Tashiro, Korefumi; Morooka, Yasuo; Yahiro, Masakazu; Katahira, Masaki; and Kora, Kazuo, 5,487,516, Cl. 246-182.00C.

Miura, Yasuhiro: *See*—
Yokoyama, Takaaki; Sasaki, Hirotaka; Ohno, Yumiko; Nakajima, Kentaro; Miura, Yasuhiro; and Mori, Hideki, 5,487,903, Cl. 426-56.000.

Miyagawa, Ichiro, to Fuji Photo Film Co., Ltd. Image read-out and reproducing apparatus. 5,488,489, Cl. 358-474.000.

Miyake, Jiro: *See*—
Brown, Gary; and Miyake, Jiro, 5,488,573, Cl. 364-578.000.

Miyamae, Akira: *See*—
Kobayashi, Fumio; Kasuga, Ikuo; and Miyamae, Akira, 5,488,594, Cl. 369-44.140.

Miyamoto, Katsuyuki: *See*—
Ozaki, Masamichi; Takasaki, Mamoru; Miyamoto, Katsuyuki; and Tsuruda, Mitsumasa, 5,487,252, Cl. 53-212.000.

Miyano, Yuichi, to Kabushiki Kaisha Toshiba. Image data processing apparatus with adjustment of image portion paste-in position to minimize amount of compressed image data. 5,488,484, Cl. 358-433.000.

Miyata, Masanori: *See*—
Fukada, Taisei; Miyata, Masanori; Adachi, Hideki; Nakamura, Shinichi; Ohki, Naoyuki; Kaneko, Tokuharu; Kuroyanagi, Satoshi; Ozaki, Hiroshi; Tahara, Hisatsugu; Kaneko, Satoshi; and Takizawa, Mitsuharu, 5,488,454, Cl. 355-202.000.

Miyauchi, Jipsei: *See*—
Shigetoh, Nobuyuki; Miyazaki, Jipsei; Nakayama, Hiroshi; Yugawa, Keiko; and Mitsumata, Tadayasu, 5,488,114, Cl. 548-510.000.

Miyazaki, Minoru, to Atsushi Maki. Fuel oil improvement apparatus. 5,487,370, Cl. 123-538.000.

Miyazaki, Toshihiko: *See*—
Yamano, Akihiko; Nose, Hiroyasu; Kawase, Toshimitsu; Miyazaki, Toshihiko; and Oguchi, Takahiro, 5,488,602, Cl. 369-126.000.

Mizukawa, Yuki; and Kobayashi, Hidetoshi, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 5,487,968, Cl. 430-544.000.

Mizuta, Akira; and Yamazaki, Fumio, to Fuji Photo Film Co., Ltd. Ultrasonic welding method and apparatus for molded resin materials. 5,487,802, Cl. 156-73.100.

Mizuta, Satoru; and Shimizu, Katsuya, to Fujitsu Limited; and Fujitsu VLSI Limited. Detection circuit for detecting a state of a control system with improved accuracy. 5,488,324, Cl. 327-77.000.

Mizutani, Hidemasa; and Kondo, Shigeki, to Canon Kabushiki Kaisha. Semiconductor device and process for producing the same. 5,488,251, Cl. 257-557.000.

Mizutani, Hideo; and Ota, Kazuya, to Nikon Corporation. Double-beam light source apparatus, position detecting apparatus and aligning apparatus. 5,488,230, Cl. 250-548.000.

Mizutani, Kazuyoshi: *See*—
Kobayashi, Fumikazu; Mizutani, Kazuyoshi; and Maemoto, Kazuo, 5,488,182, Cl. 568-660.000.

Mizutome, Atsushi: *See*—
Taniguchi, Osamu; Inoue, Hiroshi; Mizutome, Atsushi; Mihara, Tadashi; Onitsuka, Yoshihiro; and Terada, Masahiro, 5,488,388, Cl. 345-97.000.

Mkrtchyan, Mais. Time and cost efficient storage facility. 5,487,636, Cl. 414-286.000.

Mobil Oil Corp.: *See*—
Beck, Jeffrey S.; and Dessau, Ralph M., 5,488,194, Cl. 585-475.000.
Bianchini, Eber C.; Knoerzer, Anthony R.; Parr, Larry A.; and Reid, Leland W., 5,487,940, Cl. 428-349.000.
Brown, Stephen H.; and Trewella, Jeffrey C., 5,488,186, Cl. 568-897.000.
Chu, Alice S.; Jackson, Andrew; and Wu, Margaret M., 5,488,191, Cl. 585-10.000.
Mackerer, Carl R.; Roy, Timothy A.; and Blackburn, Gary R., 5,488,193, Cl. 585-455.000.

Mochizuki, Noboru: *See*—
Ikegaya, Isao; and Mochizuki, Noboru, 5,487,583, Cl. 296-65.100.

Mochizuki, Seiji; Kawakami, Kazuhisa; Nakamura, Masahiro; Ohshima, Keiichi; and Yoshida, Masanori, to Seiko Epson Corporation. Ink-jet recording apparatus and ink tank cartridge thereof. 5,488,401, Cl. 347-86.000.

Modak, Shanta; and Sampath, Lester, to Trustees of Columbia University In The City of New York. Antimicrobial glove comprising a rapid release matrix system for antiinfective agent delivery. 5,487,896, Cl. 424-402.000.

Moeggenborg, Kevin J.; and Reed, Peter E., to Nalco Chemical Company. Polymeric binders for enhancing green strength of pressed ceramics. 5,487,855, Cl. 264-63.000.

Moinard, Patrice; Thioux, Alain; and Mery, Jean Claude, to Bendix Europe Services Techniques. Revolving plate clamping device. 5,487,452, Cl. 188-72.700.

Mojaradi, Mohamad M.: *See*—
Werner, Alan J., Jr.; Mojaradi, Mohamad M.; Zomorrodi, Mehrdad; Buhler, Steven A.; and Vo, Tuan A., 5,488,301, Cl. 324-458.000.

Mojden, Andrew E.; and Hoinacki, Richard P., to Fleetwood Systems, Inc. Automatic tray loading, unloading and compensating system. 5,487,637, Cl. 414-788.400.

Moldauer, John G.: *See*—
Aebischer, Patrick; Goddard, Moses; Moldauer, John G.; Mulhauser, Paul J.; Rathbun, Anne M.; Sanberg, Paul R.; Vasconcellos, Alfred V.; and Warner, Nicholas F., 5,487,739, Cl. 604-890.100.

Molecular Device Corporation: *See*—
Hafeman, Dean G.; and Humphries, Gillian M. K., 5,487,872, Cl. 422-102.000.

Molex Incorporated: *See*—
Marchek, Kyle J.; and McClelland, Timothy R., 5,487,471, Cl. 206-725.000.

Moliner, Carlos F. I.: *See*—
Persson, Hakan B., deceased; and Moliner, Carlos F. I., 5,488,099, Cl. 530-399.000.

Mollo, James R. Variable discharge pump with low unload to secondary. 5,487,403, Cl. 137-115.000.

Molyneaux, William F., to AEG Transportation Systems, Inc. Propulsion control system cental processing unit board. 5,488,733, Cl. 395-800.000.

Monasterio, Jorge: *See*—
Marenies, Faustin T.; and Monasterio, Jorge, 5,488,467, Cl. 355-282.000.

Monnier, Kenneth J.: *See*—
Wallis, Frank S.; Houghtby, Timothy R.; Monnier, Kenneth J.; and Weatherston, Roger C., 5,487,654, Cl. 418-55.100.

Monsanto Company: *See*—
Talley, John J., 5,488,132, Cl. 560-39.000.

Montez, Karen: *See*—
Drown, David C.; and Montez, Karen, 5,487,907, Cl. 426-417.000.

Montreuil, Michel. Low amperage electronic milk level detector. 5,487,359, Cl. 119-14.170.

Monzyk, Bruce F., to Met-Tech Systems Limited. Metal extractant solution comprising N-ethyl hydroxamic acid chelants and kerosene solvent. 5,487,842, Cl. 252-60.000.
Moon, Donald D. Plant food and fertilizer applicator. 5,487,236, Cl. 47-48.500.
Mooney, Audrey J. Taco baking and serving pan. 5,487,330, Cl. 99-425.000.
Moore Business Forms, Inc.: *See*—
Russ, Timothy J.; Khatib, Khal M.; and Baker, Jay O., 5,487,915, Cl. 427-208.000.
Moran, Francis J., Jr.: *See*—
Supcoe, Robert F.; and Moran, Francis J., Jr., 5,488,076, Cl. 523-175.000.
Moran, Martin K.: *See*—
Berkowitz, Peter N.; Papadopoulos, Michael N.; Colwell, Larry W.; and Moran, Martin K., 5,488,561, Cl. 364-165.000.
Moran, Robert E.: *See*—
Coyle, Laurie; Finucane, Kevin M.; Greene, Alan P.; and Moran, Robert E., 5,487,843, Cl. 252-89.100.
Moran, Ronald S. Mulch receiving bin and method of using same. 5,487,604, Cl. 366-225.000.
More, Iain; Lewtas, Kenneth; Bland, Jacqueline D.; and Ayres, Sally J., to Exxon Chemical Patents Inc. Fuel compositions. 5,487,763, Cl. 44-393.000.
Mori, Hideki: *See*—
Yokoyama, Takaaki; Sasaki, Hirotaka; Ohno, Yumiko; Nakajima, Kentaro; Miura, Yasuhiro; and Mori, Hideki, 5,487,903, Cl. 426-56.000.
Mori, Kenichi; and Yokoyama, Shotaro, to Fuji Electric Co., Ltd. Clock signal generating device. 5,488,645, Cl. 377-20.000.
Mori, Masashi: *See*—
Takeuchi, Takashi; Saitoh, Tadashi; Matsunaga, Toshihiro; Mori, Masashi; and Fujiya, Hajime, 5,488,595, Cl. 369-54.000.
Mori, Sachio; Takechi, Shozo; and Kida, Shiro, to Shionogi & Co., Ltd. Preparation of compounds of lignan series. 5,488,134, Cl. 560-53.000.
Moriarty, Robert M.: *See*—
Knutson, Joyce C.; Bishop, Charles W.; and Moriarty, Robert M., 5,488,120, Cl. 552-653.000.
Morii, Makito: *See*—
Niwa, Takashi; Shinohara, Kenji; and Morii, Makito, 5,488,207, Cl. 200-43.040.
Morioka, Tatsuya: *See*—
Taneya, Mototaka; Kawanishi, Hidenori; Morioka, Tatsuya; and Shimonaka, Atsushi, 5,488,678, Cl. 385-14.000.
Morito, Nobuyuki: *See*—
Tobiyama, Yoichi; Kato, Chiaki; Morito, Nobuyuki; and Kimura, Hajime, 5,487,919, Cl. 427-327.000.
Morley, Stephen, to Hewlett-Packard Company. Communication system. 5,488,610, Cl. 370-82.000.
Moroni, Jonny, to AlliedSignal Europe Services Techniques. Thermal protection device. 5,487,453, Cl. 188-264.00G.
Morooka, Yasuo: *See*—
Murata, Satoru; Kawabata, Atsushi; Miura, Shuuichi; Tashiro, Korefumi; Morooka, Yasuo; Yahiro, Masakazu; Katahira, Masaki; and Kera, Kazuo, 5,487,516, Cl. 246-182.00C.
Morrissey, Michael M., to Ciba-Geigy Corporation. Amidino compounds, their manufacture and method of treatment. 5,488,160, Cl. 564-165.000.
Morrow, James G.: *See*—
Saindon, Stephen A.; Heindel, Kevin O.; and Morrow, James G., 5,488,480, Cl. 356-429.000.
Morrow, William D. Inverted kingpost crane. 5,487,478, Cl. 212-253.000.
Mörs, Siegfried: *See*—
Hellkuhl, Ludger; Mörs, Siegfried; Pelzer, Günter; and Wesselmann, Friedhelm, 5,487,635, Cl. 414-277.000.
Morton, Gerald J.: *See*—
Turtle, Howard R.; Morton, Gerald J.; and Larntz, F. Kinley, 5,488,725, Cl. 395-600.000.
MOS Electronics, Corp.: *See*—
Chan, Alfred K., 5,488,709, Cl. 395-445.000.
Mosaner, Knud: *See*—
Koch, Robert; Mosaner, Knud; and Schleicher, Roland, 5,487,555, Cl. 280-403.000.
Moss, Gaylord E., to Hughes Aircraft Company. Holographic CHMSL including a hologram assembly and a refractive element laminarly attached thereto for diverging zero order beam. 5,488,493, Cl. 359-13.000.
Most, Elmer E., Jr.: *See*—
Aneja, Arun P.; Bennie, David G.; Collins, Robert J.; Frankfort, Hans Rudolf E.; Johnson, Stephen B.; Knox, Benjamin H.; and Most, Elmer E., Jr., 5,487,859, Cl. 264-103.000.
Motaei, Saied: *See*—
Hlousek, Louis; Odencrantz, K. C.; Oswald, Richard K.; Dahlin, Donald W.; Motaei, Saied; Siggins, Paul W.; Wong, Kenny; Smith, Ronald A.; and Scheinert, Philip M., 5,488,240, Cl. 250-231.160.
Motorola, Inc.: *See*—
Agahi-Kesheh, Darioush; Zakman, Zdravko M.; and Kenoun, Robert, 5,488,335, Cl. 333-206.000.
Carvella, James S.; and Quigley, John H., 5,488,320, Cl. 327-65.000.
Chiou, Herng-Der; and Lee, Tien-Yu T., 5,487,355, Cl. 117-13.000.
Faris, Randi W.; and Henz, Christopher, 5,488,359, Cl. 340-825.440.
Fox, Thomas M.; Anderson, Neal R.; and Heeren, Julius A., 5,488,662, Cl. 380-34.000.
Gonzales, David R.; and Carichner, Gordon A., 5,488,688, Cl. 395-183.100.
Guzik, Andrzej T.; Smith, Todd L.; and Marchuk, Jeffrey P., 5,487,674, Cl. 439-83.000.
Haas, Kevin L.; Haas, Ken A.; and Vought, Kimber J., 5,487,211, Cl. 29-25.350.
Hedayatnia, Mostafa; and Graham-Meighan, Margaret, 5,488,351, Cl. 340-407.100.
Hluchyj, Michael G.; and Lee, Whay C., 5,488,609, Cl. 370-84.000.
Kazecki, Henry L.; and Diehl, John W., 5,488,638, Cl. 375-347.000.
Redden, James P.; Terris, David; and Olds, Keith A., 5,488,640, Cl. 375-357.000.
Ristic, Ljubisa; Gutteridge, Ronald J.; Koucheng, Wu; Calaway, Michael F.; and Dunn, William C., 5,487,305, Cl. 73-514.320.
Schellinger, Michael J., 5,488,649, Cl. 379-62.000.
Seymour, Leslie G., 5,488,559, Cl. 364-449.000.
Sharma, Umesh; Hayden, Jim; and Kirsch, Howard C., 5,488,579, Cl. 365-185.000.
Mountain Safety Research (MSR): *See*—
Fife, James F.; Vorhis, Daniel J.; Laughlen, Kenneth D.; and Dienes, Nancy L., 5,487,833, Cl. 210-232.000.
Mouri, Takayuki; and Isomura, Tohru, to Ikeda Bussan Co., Ltd. Power seat slide device. 5,487,520, Cl. 248-429.000.
Mowrer, Kevin B.; and Beck, Robert L., to Tonka Corporation. Expandable wheel assembly. 5,487,692, Cl. 446-465.000.
Moyers, John C.: *See*—
Casada, Donald A.; Haynes, Howard D.; Moyers, John C.; and Stewart, Brian K., 5,487,302, Cl. 73-168.000.
Mrowiec, David J.; and Good, Jef W., to Sundstrand Corporation. System of protection for electric power distribution failures. 5,488,532, Cl. 361-63.000.
MTC Co., Ltd.: *See*—
Ohmi, Tadahiro; Yonekawa, Naomichi; Horiki, Hiroyuki; Kaji, Toshimitsu; Kunimoto, Fumitomo; and Tamaki, Takeo, 5,487,398, Cl. 134-95.100.
Muchel, Franz, to Carl-Zeiss-Stiftung. Color corrected ocular. 5,488,512, Cl. 359-646.000.
Muderlak, Kenneth J.: *See*—
Cole, Josephine A.; and Muderlak, Kenneth J., 5,487,617, Cl. 402-4.000.
Mueller, Douglas L.: *See*—
Liddell, Peter A.; Mueller, Douglas L.; and Wohlers, Gary L., 5,488,294, Cl. 324-207.210.
Mueller, Roger P.; Mueller, Roy P.; Nemeth, Joe; and Schoning, Robert, to RPM Industries, Inc. Two-piece high top shoe tree. 5,487,198, Cl. 12-117.400.
Mueller, Roy P.: *See*—
Mueller, Roger P.; Mueller, Roy P.; Nemeth, Joe; and Schoning, Robert, 5,487,198, Cl. 12-117.400.
Mueller-Hagen, Gerd; Heinrich, Horst; and Meyer, Baerbel, to BASF Schwarzheide GmbH. Polyetheresterols, their preparation, and their use in polyurethanes. 5,488,074, Cl. 521-172.000.
Mulhauser, Paul J.: *See*—
Aebischer, Patrick; Goddard, Moses; Moldauer, John G.; Mulhauser, Paul J.; Rathbun, Anne M.; Sanberg, Paul R.; Vasconcellos, Alfred V.; and Warner, Nicholas F., 5,487,739, Cl. 604-890.100.
Müller, Andreas; Grubisic, Vatroslav; and Fischer, Gerhard, to Fraunhofer-Gesellschaft zur Foerderung der Angewandten Forschung. Test rig and process for testing motor vehicle assemblies, in particular independent wheel suspension. 5,487,301, Cl. 73-118.100.
Müller, Klaus-Helmut: *See*—
Haas, Wilhelm; Müller, Klaus-Helmut; König, Klaus; Santel, Hans-Joachim; Lürssen, Klaus; and Schmidt, Robert R., 5,488,028, Cl. 504-193.000.
Mulligan, Charles R.: *See*—
Jenkins, Thomas E.; Mulligan, Charles R.; and Jubenville, Duane, 5,487,239, Cl. 49-498.100.
Mullins, Atty T.: *See*—
Kaplan, Ronald M.; Shuchatowitz, Robert; and Mullins, Atty T., 5,488,719, Cl. 395-600.000.
Multifastener Corporation: *See*—
Ladouceur, Harold A., 5,487,215, Cl. 29-702.000.
Multimedia Systems Corporation: *See*—
Lewis, Scott W., 5,488,411, Cl. 348-8.000.
Mumper, Eric W.: *See*—
Dias, Donald R.; and Mumper, Eric W., 5,488,284, Cl. 320-39.000.
Munakata, Tomoo: *See*—
Ozaki, Takahiro; Munakata, Tomoo; Goto, Fumio; and Tsuchiya, Tetsuo, 5,487,837, Cl. 252-25.000.
Mundkur, Yatin G.: *See*—
Vegesna, Anantakotiraju; Avula, Jayachandra B.; Jewett, Peter H.; and Mundkur, Yatin G., 5,488,729, Cl. 395-800.000.
Muragishi, Yasushi: *See*—
Kurita, Yutaka; and Muragishi, Yasushi, 5,487,533, Cl. 267-140.500.
Murakami, Hitomi: *See*—
Takishima, Yasuhiro; Wada, Masahiro; and Murakami, Hitomi, 5,488,616, Cl. 371-30.000.
Murakami, Masami: *See*—
Ohno, Takamasa; Kato, Keietsu; Yamaguchi, Yoshiyuki; Murakami, Masami; Suzuki, Shogo; Kanda, Shoichi; and Nakagawa, Tsuyoshi, 5,487,425, Cl. 166-295.000.
Murakami, Motoichi: *See*—
Takeda, Masashi; Fukuhara, Kazuyuki; and Murakami, Motoichi, 5,487,364, Cl. 123-193.600.

Murayama, Meiji: *See*—
Takemoto, Takatoshi; Yoshikawa, Masayoshi; Aoyama, Moriyuki; Murayama, Meiji; and Kawashima, Kazunari, 5,487,686, Cl. 451-105.000.

Murata Manufacturing Co., Ltd.: *See*—
Asida, Shyuji; Takahasa, Haruo; and Kataoki, Takayo, 5,488,348, Cl. 338-22.000.

Kuge, Daisuke, 5,487,588, Cl. 294-119.100.

Murata, Tatsuo; Kawabata, Atsushi; Miura, Shunichi; Tashiro, Kunifumi; Morooka, Yasuo; Yahiro, Masakazu; Katahira, Masaki; and Kera, Kazuo, to Hitachi, Ltd. Train control system. 5,487,516, Cl. 246-182.00C.

Murayama, Masahiro, to Canon Kabushiki Kaisha. Facsimile with user selective compression methods. 5,488,483, Cl. 358-426.000.

Murayama, Masami: *See*—
Kakuma, Satoshi; Yoshimura, Shoji; Hajikano, Kazuo; Murayama, Masami; and Okuyama, Yuzo, 5,488,606, Cl. 370-16.000.

Murayama, Yasushi: *See*—
Mitomi, Tatsuo; Aoki, Tsunehiro; Murayama, Yasushi; Uchida, Takashi; Kobayashi, Tohru; Ikkatai, Masatoshi; and Nemura, Masaharu, 5,488,390, Cl. 347-43.000.

Murphy, Alan S.; and Tustin, Patricia, to International Business Machines Corporation. Data processing system. 5,488,686, Cl. 395-161.000.

Murphy, David M.: *See*—
Everman, Michael R.; Murphy, David M.; and Wachbrit, James J., 5,487,791, Cl. 136-245.000.

Murphy, Michael A.: *See*—
Kennon, Jerry M.; Murphy, Michael A.; and Shuey, Kenneth C., 5,488,565, Cl. 364-483.000.

Murr, Mark: *See*—
Jackson, Thomas; and Murr, Mark, 5,488,379, Cl. 342-359.000.

Muscato, Robert: *See*—
Appolonia, Jack; Muscato, Robert; and Witsil, George, 5,487,908, Cl. 426-520.000.

Mussiac, Jean-Noël: *See*—
Combot-Coureau, Yves; Le Saint, Benoît; Mussiac, Jean-Noël; and Le Quere, Philippe, 5,487,572, Cl. 285-308.000.

Myers, Andrew G., to California Institute of Technology. Synthesis of compounds with predetermined chirality. 5,488,131, Cl. 560-3.000.

N.E. Chemcat Corporation: *See*—
Itoh, Takashi; and Kosaki, Yukio, 5,487,268, Cl. 60-274.000.

N.V. Bekaert S.A.: *See*—
De Wiegenaere, Johan; Subbe, Luc; and Van Giel, Frans, 5,487,262, Cl. 57-58.650.

Nagahata, Takaya, to Rohm Co., Ltd. Printing element drive device having separately operating shift registers. 5,488,403, Cl. 347-211.000.

Nagai, Masahiko: *See*—
Takase, Akira; Kai, Hiroyuki; Nishida, Kuniyoshi; Shimomoto, Shoji; and Nagai, Masahiko, 5,488,159, Cl. 564-164.000.

Nagao, Masashi, to Mitsubishi Denki Kabushiki Kaisha. Cryogenic refrigerator. 5,487,272, Cl. 62-6.000.

Nagao, Mitsuhiro; Shimbayashi, Kohji; and Ishida, Yoshiyuki, to Fujitsu Limited; and Fujitsu VLSI Limited. Semiconductor memory device. 5,488,581, Cl. 365-189.050.

Nagata, Yasufumi: *See*—
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Yamagishi, Toshio; Nanba, Masakazu; Egami, Norifumi; Tanioka, Kenkichi; Kurashige, Mitsuhiro; Tsuji, Kazutaka; Kaneko, Yoshiyuki; Makishima, Tatsuo; Nagatsuma, Kazuyuki; Ohshima, Tetsuya; and Nakano, Yasushi, 5,488,386, Cl. 345-74.000.

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Ohta, Yutaka; and Nagoya, Takatoshi, 5,487,358, Cl. 117-200.000.

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Takahashi, Keiichi; Kataoka, Hiroshi; Ichikawa, Haruo; Takatori, Tetsuya; and Naito, Toshiharu, 5,487,513, Cl. 242-348.100.

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Ohno, Takamasa; Kato, Keietsu; Yamaguchi, Yoshiyuki; Murakami, Masumi; Suzuki, Shogo; Kanda, Shoichi; and Nakagawa, Tsuyoshi, 5,487,425, Cl. 166-295.000.

Nakajima, Kentaro: *See*—
Yokoyama, Takaaki; Sasaki, Hirotaka; Ohno, Yumiko; Nakajima, Kentaro; Miura, Yasuhiro; and Mori, Hideki, 5,487,903, Cl. 426-56.000.

Nakamori, Tomohiro; Hashimoto, Hiroshi; Endo, Soya; Machino, Hitoshi; and Ishizu, Masanori, to Canon Kabushiki Kaisha. Semiconductor laser device having chip-mounted heating element. 5,488,625, Cl. 372-50.000.

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Sawada, Susumu; Anan, Junichi; Nakamura, Hiroki; and Sakaya, Yoshihiro, 5,487,823, Cl. 204-298.120.

Nakamura, Hiroyuki: *See*—
Tomita, Hironori; Nakamura, Tohru; Wada, Takuya; and Nakamura, Hiroyuki, 5,488,603, Cl. 369-219.000.

Nakamura, Kazuo: *See*—
Takahashi, Tadashi; Fujita, Takashi; Nakamura, Kazuo; and Tsukamoto, Seiichi, 5,488,022, Cl. 502-115.000.

Nakamura, Masahiro: *See*—
Mochizuki, Seiji; Kawakami, Kazuhiro; Nakamura, Masahiro; Ohshima, Koichi; and Yoshida, Masanori, 5,488,401, Cl. 347-66.000.

Nakamura, Masaru: *See*—
Tanabe, Noboru; Oyanagi, Shigeru; Baba, Shinichi; Kaminishi, Katsuji; Nakamura, Masaru; and Sekido, Kazunori, 5,488,735, Cl. 395-800.000.

Nakamura, Shinichi: *See*—
Fukada, Taisei; Miyata, Masanori; Adachi, Hideki; Nakamura, Shinichi; Ohki, Naoyuki; Kaneko, Tokuharu; Kuroyanagi, Satoshi; Ozaki, Hiroshi; Tahara, Hisatsugu; Kaneko, Satoshi; and Takizawa, Mitsuharu, 5,488,454, Cl. 355-202.000.

Nakamura, Tetsuya: *See*—
Ishikawa, Masaaki; Iguchi, Michihisa; Hashizume, Hiroshi; Nakamura, Tetsuya; Satou, Kouichirou; Okano, Yoshiaki; Fukuyama, Hirotaka; Kanagata, Satoshi; Ishikawa, Takashi; Arai, Seiji; Sakai, Chinobu; and Kabei, Takahito, 5,488,462, Cl. 355-215.000.

Nakamura, Tohru: *See*—
Tomita, Hironori; Nakamura, Tohru; Wada, Takuya; and Nakamura, Hiroyuki, 5,488,603, Cl. 369-219.000.

Nakamura, Yasushi: *See*—
Makita, Shigeru; Sano, Yoshihiko; Nakamura, Yasushi; and Ota, Hiroyuki, 5,487,607, Cl. 374-158.000.

Nakanishi, John S.: *See*—
Lopata, Eugene S.; and Nakanishi, John S., 5,487,920, Cl. 427-489.000.

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Yamagishi, Toshio; Nanba, Masakazu; Egami, Norifumi; Tanioka, Kenkichi; Kurashige, Mitsuhiro; Tsuji, Kazutaka; Kaneko, Yoshiyuki; Makishima, Tatsuo; Nagatsuma, Kazuyuki; Ohshima, Tetsuya; and Nakano, Yasushi, 5,488,386, Cl. 345-74.000.

Nakao, Kiyoshi: *See*—
Suzuki, Isao; Shindo, Mazuo; and Nakao, Kiyoshi, 5,487,808, Cl. 156-556.000.

Nakata, Kazushi: *See*—
Yamamoto, Shigeru; Matsushita, Shigenori; Zhang, Shu huai; Nishita, Satoru; and Nakata, Kazushi, 5,487,428, Cl. 172-4.500.

Nakata, Toshinobu: *See*—
Tsumemi, Hidenari; and Nakata, Toshinobu, 5,488,144, Cl. 560-301.000.

Nakaya, Hideo: *See*—
Kondo, Tetsujiro; and Nakaya, Hideo, 5,488,618, Cl. 371-67.100.

Nakayama, Hiroshi: *See*—
Shigetoh, Nobuyuki; Miyazaki, Jipsei; Nakayama, Hiroshi; Yugawa, Keiko; and Mitsumata, Tadayasu, 5,488,114, Cl. 548-510.000.

Nakayama, Yoshifumi: *See*—
Ota, Yutaka; Iguchi, Yukinobu; and Nakayama, Yoshifumi, 5,488,264, Cl. 313-412.000.

Nalco Chemical Company: *See*—
Moeggenborg, Kevin J.; and Reed, Peter E., 5,487,855, Cl. 264-63.000.

Namco Controls Corporation: *See*—
Plott, Robert J., 5,488,307, Cl. 324-555.000.

Namisniak, Dianna; and Namisniak, Lee. Food inventory system. 5,487,276, Cl. 62-125.000.

Namisniak, Lee: *See*—
Namisniak, Dianna; and Namisniak, Lee, 5,487,276, Cl. 62-125.000.

Nanataki, Tsutomu: *See*—
Abe, Masahiro; Nanataki, Tsutomu; and Yano, Shinsuke, 5,488,019, Cl. 501-139.000.

Nanba, Masakazu: *See*—
Yamagishi, Toshio; Nanba, Masakazu; Egami, Norifumi; Tanioka, Kenkichi; Kurashige, Mitsuhiro; Tsuji, Kazutaka; Kaneko, Yoshiyuki; Makishima, Tatsuo; Nagatsuma, Kazuyuki; Ohshima, Tetsuya; and Nakano, Yasushi, 5,488,386, Cl. 345-74.000.

Napa Pipe Corporation: *See*—
Williamson, Calvin C.; and Salsman, Jeffrey S., 5,487,299, Cl. 73-12.090.

Nappa, Mario J.: *See*—
Sievert, Allen C.; and Nappa, Mario J., 5,488,189, Cl. 570-172.000.

Nathenson, Richard D.; Apt, Jerome, Jr.; Uram, Martin J.; Brumbaugh, Paul M.; Brawley, Gary H.; Hackman, Donald J.; and Christenson, Brian, to Electric Power Research Institute, Inc. Apparatus for pneumatic excavation. 5,487,229, Cl. 37-347.000.

National Blood Authority: *See*—
Bradley, Benjamin A. D. B.; Doyle, Alan; and Kumpel, Belinda M., 5,487,891, Cl. 424-142.100.

National Graphics, Inc.: *See*—
Goggins, Timothy P., 5,488,451, Cl. 355-77.000.

National Science Council: *See*—
Chin, Tsung-Shune; and Deng, Ming-Cheng, 5,487,954, Cl. 428-694.00B.

National Semiconductor Corp.: *See*—
Yeung, Pak-Ho, 5,488,289, Cl. 323-312.000.

National Transcommunications Limited: *See*—
Mason, Arthur G.; and Gledhill, Jeffrey J., 5,488,632, Cl. 375-260.000.

Naudin, Bernard J.: *See*—
Bailey, Warren D.; Barker, Kenenth J.; Bellinghausen, Joan M.; Calhoun, George M.; Naudin, Bernard J.; and Suffern, Edward, 5,488,734, Cl. 395-800.000.

Nebashi, Satoshi: *See*—

Kobayashi, Michio; Hirayama, Hiroshi; and Nebashi, Satoshi, 5,488,591, Cl. 369-13.000.
NEC Corporation: *See*—
Fujimoto, Jun, 5,487,928, Cl. 428-36.400.
Harada, Hirotaka, 5,488,370, Cl. 341-161.000.
Kiuchi, Toyoo, 5,488,712, Cl. 395-431.000.
Saitou, Tosiaki, 5,487,220, Cl. 30-90.600.
Shima, Tomoaki, 5,488,614, Cl. 371-22.300.
Yamanaka, Yutaka, 5,488,600, Cl. 369-116.000.
Necchi Compressori S.r.l.: *See*—
Alfano, Biagio; and Biscaldi, Edoardo, 5,487,648, Cl. 417-312.000.
Nedblake, Gráydon W.; and Garber, John, to Nedblake, Greydon W. System for producing labels from a web. 5,487,807, Cl. 156-353.000.
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Nedblake, Gráydon W.; and Garber, John, 5,487,807, Cl. 156-353.000.
Nedderman, William H., Jr, to United States of America, Navy. Control surface for underwater vehicle. 5,487,351, Cl. 114-332.000.
Neer, Robert E.: *See*—
Scherch, Richard P.; and Neer, Robert E., 5,487,205, Cl. 15-250.310.
Negishi, Nobuyasu, to Pioneer Electronic Corporation. Magneto-optical disk having zero kerr rotation angle at room temperature. 5,488,604, Cl. 369-275.200.
Negrin, Dan, to Kelsey-Hayes Company. Method and system for controlling rear wheel anti-lock brake control on four-wheel drive vehicles braking on high mu surfaces. 5,487,596, Cl. 303-149.000.
Nelson, John. Vandalism prevention device for highway bridges. 5,487,199, Cl. 14-74.500.
Nelson, Steven M. Windshield wiper with deicer. 5,487,204, Cl. 15-250.190.
Nemeth, Joe: *See*—
Mueller, Roger P.; Mueller, Roy P.; Nemeth, Joe; and Schoning, Robert, 5,487,198, Cl. 12-117.400.
Nemoto, Mitsugu: *See*—
Nakagama, Kiyohari; and Nemoto, Mitsugu, 5,488,457, Cl. 355-203.000.
Nemura, Masaharu: *See*—
Mitomi, Tatsuo; Aoki, Tomohiro; Murayama, Yasushi; Uchida, Takashi; Kobayashi, Tohru; Ikkatai, Masatoshi; and Nemura, Masaharu, 5,488,399, Cl. 347-43.000.
Nestec S.A.: *See*—
Askman, Lars; Leonhardt, Werner; and Svahn, Ingemar, 5,487,905, Cl. 426-297.000.
Daly, William G., 5,487,904, Cl. 426-96.000.
Nesvadba, Peter, to Ciba-Geigy Corporation. 3-(acyloxyphenyl)benzofuran-2-one stabilisers. 5,488,117, Cl. 549-302.000.
Nett, Torrance M.; and Glode, Leonard M., to Colorado State University Research Foundation. Method for sterilizing animals using hormone-toxin conjugate compounds. 5,488,036, Cl. 514-15.000.
Neturen Co., Ltd.: *See*—
Tanaka, Yoshimasa; and Tabuchi, Hisashi, 5,488,219, Cl. 219-644.000.
Neuberger, Wolfgang: *See*—
Krisvoshlykov, Sergej G.; and Neuberger, Wolfgang, 5,488,506, Cl. 359-341.000.
Neufeld, Arthur H., to Telor Ophthalmic Pharmaceuticals, Inc. Methods and products for treating presbyopia. 5,488,050, Cl. 514-236.200.
New Holland North America, Inc.: *See*—
Schott, Allan N., 5,487,318, Cl. 74-606.00R.
Newby, Charles D., to Crane Plastics Company Limited Partnership. Metal-polymer composite insulative spacer for glass members and insulative window containing same. 5,487,937, Cl. 428-317.100.
Newkirk, Marc S., to Lanxide Technology Company, LP. Method for forming metal matrix composite bodies by using a modified spontaneous infiltration process and products produced thereby. 5,487,420, Cl. 164-97.000.
Newman, G. Robert; and Reeves, Edwin H., to Harsco Corporation. Spiker with hole sensing. 5,487,341, Cl. 104-17.100.
Newville, Duane H. Flow-through washing and scrubbing brush handle. 5,487,529, Cl. 251-148.000.
NGK Insulators, Ltd.: *See*—
Abe, Masahiro; Nanataki, Tsutomu; and Yano, Shinsuke, 5,488,019, Cl. 501-139.000.
Nguyen, Frank: *See*—
Truckai, Csaba; Jaraczewski, Richard S.; Nguyen, Frank; and West, Scott H., 5,487,757, Cl. 607-122.000.
Nguyen, Kham X.: *See*—
Wendorf, Kent; Hilton, Ronald N.; Pang, Nicholas Y.; Baker, Jeffrey L.; and Nguyen, Kham X., 5,488,706, Cl. 395-375.000.
Nguyen, Michael A.; Stewart, Lowell J.; Kline, Daniel S.; Boeller, Robert A.; Ta, Chuong C.; and Haselby, Robert D., to Hewlett-Packard Company. Wide-swath printer/plotter using multiple printheads. 5,488,397, Cl. 347-40.000.
NHK Spring Co., Ltd.: *See*—
Taguchi, Kohei; Ayada, Michihiko; and Shingu, Hideo, 5,487,866, Cl. 419-28.000.
Ni, Jian M. High current continuous welding device. 5,488,217, Cl. 219-137.310.
Nickerson, Brian: *See*—
Keith, Michael; Coelho, Rohan; Golin, Stuart; and Nickerson, Brian, 5,488,568, Cl. 364-514.00R.
Nickolls, John R.: *See*—
McKee, Mark P.; Zapisek, John; Bulfer, David M.; Long, John M.; Nickolls, John R.; and Blank, William T., 5,488,694, Cl. 395-824.000.
Nidek Co., Ltd.: *See*—
Ota, Yasuo; Enomoto, Masanori; and Abe, Hitoshi, 5,488,443, Cl. 351-221.000.
Nieh, Simon K.; Matossian, Jesse N.; Krajenbrink, Frans G.; and Schumacher, Robert W., to Hughes Aircraft Company. Surface preparation and deposition method for titanium nitride onto carbon-containing materials. 5,487,922, Cl. 427-528.000.
Niemczyk, Thomas: *See*—
Allen, Fritz; and Niemczyk, Thomas, 5,488,567, Cl. 364-497.000.
Niethammer, Bernd, to Hydraulik-Ring Antriebs- und Steueringstechnik GmbH. Proportional solenoid valve unit. 5,487,410, Cl. 137-625.650.
Nightingale, Kathryn: *See*—
Trahey, Gregg E.; Kornguth, Phyllis; Nightingale, Kathryn; and Walker, William F., 5,487,387, Cl. 128-660.020.
Nihon Superior Co., Ltd.: *See*—
Nishimura, Tetsuro, 5,487,868, Cl. 420-559.000.
Nikon Corporation: *See*—
Mizutani, Hideo; and Ota, Kazuya, 5,488,230, Cl. 250-548.000.
Nilsen, Thor W.; and Prensky, Wolf, to PolyProbe, Inc. Methods for detecting and assaying nucleic acid sequences. 5,487,973, Cl. 435-6.000.
Nilsson, Bo-Arne, to Björkebo Gilard AB. Arrangement for a carton. 5,487,505, Cl. 229-191.000.
Nimni, Marcel. Anti-fungal nail lacquer and method therefor. 5,487,776, Cl. 106-18.350.
Nimura, Mitsuo; Hirooka, Kazuhiko; Koh, Shokyo; and Watanabe, Masao, to Canon Kabushiki Kaisha. Image forming apparatus to form images onto a sheet a plurality of times. 5,488,463, Cl. 355-322.000.
Nippon Filcon Co., Ltd.: *See*—
Kuji, Takehito; and Yasuoka, Tatsuhiko, 5,487,414, Cl. 139-383.00A.
Nippon Kayaku Kabushiki Kaisha: *See*—
Koshigoe, Taichi; Satoh, Hitoshi; and Yamamoto, Kenichi, 5,488,118, Cl. 549-518.000.
Nippon Sanmo Sensyoku Co., Ltd.: *See*—
Gomibuchi, Reizo, 5,487,942, Cl. 428-364.000.
Nippon Steel Corporation: *See*—
Kawamura, Koichiro, 5,488,008, Cl. 437-52.000.
Nippon Telegraph and Telephone Corporation: *See*—
Hamade, Toshiharu; Shiotani, Masaichi; Shimo, Yukio; and Higashikata, Munehiko, 5,488,304, Cl. 324-520.000.
Nippondenso Co., Ltd.: *See*—
Hatta, Hironobu, 5,488,540, Cl. 361-794.000.
Iida, Hisashi; and Honjoh, Keiji, 5,487,372, Cl. 123-585.000.
Kato, Hideyuki; Sugawara, Ryoichi; Horii, Yasutoshi; and Hiramatsu, Hiromi, 5,488,545, Cl. 362-32.000.
Takamura, Kozo, 5,488,262, Cl. 313-141.000.
Truruta, Kazuhiro; Himi, Hiroaki; Asai, Akiyoshi; and Fujino, Seiji, 5,488,243, Cl. 257-314.000.
Yamashita, Yukihiro; Ikuta, Kenji; and Isomura, Shigenori, 5,487,270, Cl. 60-276.000.
Nishibe, Yasushi, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Apparatus for driving and controlling motor. 5,488,276, Cl. 318-473.000.
Nishida, Kuniyoshi: *See*—
Takase, Akira; Kai, Hiroyuki; Nishida, Kuniyoshi; Shinomoto, Shoji; and Nagai, Masahiko, 5,488,159, Cl. 564-164.000.
Nishikawa, Yuji; and Onishi, Masanori, to Shinki Electric Co., Ltd. Travel control method, travel control device, and mobile robot for mobile robot systems. 5,488,277, Cl. 318-587.000.
Nishikawa, Yukie: *See*—
Ishikawa, Masayuki; Nishikawa, Yukie; Saito, Shinji; Parbrook, Peter J.; Onomura, Masaaki; Nitta, Koichi; and Hatakoshi, Genichi, 5,488,233, Cl. 257-94.000.
Nishimoto, Uichiro: *See*—
Sotoya, Kohshiro; Abe, Hiroshi; Aikawa, Jun; Taniguchi, Hideki; and Nishimoto, Uichiro, 5,488,168, Cl. 564-506.000.
Nishimura, Asao; Kitano, Makoto; and Shimizu, Ichio, to Hitachi, Ltd. Plastic-molded-type semiconductor device. 5,488,254, Cl. 257-707.000.
Nishimura, Isao: *See*—
Sakamoto, Mitsuo; Koshika, Norihide; Nishimura, Isao; Sasaki, Katsuyasu; and Oorui, Satoshi, 5,487,534, Cl. 267-141.100.
Nishimura, Michio: *See*—
Yamamoto, Koji; Hanafusa, Masahiro; Onuma, Fumio; and Nishimura, Michio, 5,488,469, Cl. 356-72.000.
Nishimura, Michiyo, to Canon Kabushiki Kaisha. Semiconductor optical amplifier having reduced polarization dependence. 5,488,507, Cl. 359-344.000.
Nishimura, Tetsuro, to Nihon Superior Co., Ltd. Tin based solder alloy containing lead, antimony, and tellurium. 5,487,868, Cl. 420-559.000.
Nishino, Yutaka: *See*—
Nishitani, Yasuhiro; Irie, Tadashi; and Nishino, Yutaka, 5,488,107, Cl. 540-541.000.
Nishioka, Jun: *See*—
Kakishita, Osamu; Nishioka, Jun; Fujita, Takeshi; and Matsuo, Katsuaki, 5,487,947, Cl. 428-424.400.
Nishita, Satoru: *See*—
Yamamoto, Shigeru; Matsushita, Shigenori; Zhang, Shu huai; Nishita, Satoru; and Nakata, Kazushi, 5,487,428, Cl. 172-4.500.
Nishitani, Yasuhiro; Irie, Tadashi; and Nishino, Yutaka, to Shionogi Seiyaku Kabushiki Kaisha. Intermediates for pyrrolidylthiocarbapenem derivative. 5,488,107, Cl. 540-541.000.
Nissan Motor Company, Limited: *See*—
Kamioka, Hideki; Kobayashi, Kazumitsu; Shimamura, Masahiko; and Takeuchi, Kiyoshi, 5,488,311, Cl. 324-674.000.

Nissan Motor Co., Ltd.: *See*—
Matsuda, Toshiro, 5,488,557, Cl. 364-426.020.
Nisshinbo Industries, Inc.: *See*—
Imashiro, Yasuo; Horie, Naofumi; and Yamane, Takeshi, 5,488,170, Cl. 568-12.000.
Nisso Engineering Co., Ltd.: *See*—
Ohmi, Tadahiro; Yonekawa, Naomichi; Horiki, Hiroyuki; Kaji, Toshimitsu; Kunimoto, Fumitomo; and Tamaki, Takeo, 5,487,398, Cl. 134-95.100.
Nitayama, Akihiro: *See*—
Sunouchi, Kazumasa; Takato, Hiroshi; Ozaki, Tohru; Okabe, Naoko; Hieda, Katsuhiko; Horiguchi, Fumio; Nitayama, Akihiro; Yamada, Takashi; Hasimoto, Kouji; and Inoue, Satosi, 5,488,242, Cl. 257-301.000.
Nitta, Itaru; and Asai, Kuniaki, to Sumitomo Chemical Company, Limited. Process for producing highly pure carboxylic acid phenyl esters. 5,488,138, Cl. 560-144.000.
Nitta, Koichi: *See*—
Ishikawa, Masayuki; Nishikawa, Yukie; Saito, Shinji; Parbrook, Peter J.; Onomura, Masaaki; Nitta, Koichi; and Hatakoshi, Genichi, 5,488,233, Cl. 257-94.000.
Nitto Chemical Industry Co., Ltd.: *See*—
Ohno, Takamasa; Kato, Keietsu; Yamaguchi, Yoshiyuki; Murakami, Masami; Suzuki, Shogo; Kanda, Shoichi; and Nakagawa, Tsuyoshi, 5,487,425, Cl. 166-295.000.
Nivens, David E.; Chambers, James Q.; and White, David C., to United States of America, Navy. Apparatus for and method of detecting/identifying microbial contamination in ultra-pure water systems. 5,487,981, Cl. 435-30.000.
Niwa, Takashi; Shinohara, Kenji; and Morii, Makito. Key switch with a locking arrangement on a rotating element. 5,488,207, Cl. 200-43.040.
Noda, Shinya: *See*—
Tsuda, Tadayuki; Sekine, Kazumi; Ikemoto, Isao; Watanabe, Kazushi; Sasago, Yoshikazu; Shimizu, Yasushi; Noda, Shinya; and Kobayashi, Kazunori, 5,488,459, Cl. 355-211.000.
Nogami, Kazutaka: *See*—
Shiraishi, Sumako; Masuda, Masami; and Nogami, Kazutaka, 5,488,326, Cl. 327-408.000.
Nojiri, Hironobu; Yakushiji, Kazuyuki; Yoshinaga, Minoru; and Terasaka, Hiroyuki, to Toray Industries, Inc. Take-up apparatus for and package of tape type non-twisted carbon fiber bundle. 5,487,512, Cl. 242-471.000.
Nomoto, Katsuhiko: *See*—
Chida, Atsushi; Sannomiya, Hitoshio; Nomoto, Katsuhiko; Okamoto, Hiroshi; and Yamamoto, Yoshihiro, 5,487,786, Cl. 118-723.00E.
Nomoto, Takashi; Hayashi, Masahiro; Shibata, Jun; Iwasawa, Yoshikazu; Mitsuya, Morihiro; Iida, Yoshiaki; Nonoshita, Katsumasa; and Nagata, Yasufumi, to Banyu Pharmaceutical Co., Ltd. Substituted amic acid derivatives. 5,488,149, Cl. 562-449.000.
Nonoshita, Katsumasa: *See*—
Nomoto, Takashi; Hayashi, Masahiro; Shibata, Jun; Iwasawa, Yoshikazu; Mitsuya, Morihiro; Iida, Yoshiaki; Nonoshita, Katsumasa; and Nagata, Yasufumi, 5,488,149, Cl. 562-449.000.
Norand Corporation: *See*—
Danielson, Arvin D.; Schultz, Darald R.; Silva, Dennis; Boatwright, Darrell L.; Austin, Rickey G.; and Alt, Daniel E., 5,488,575, Cl. 364-707.000.
Noritsu Koki, Co.: *See*—
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Norman, Bruce G.: *See*—
Rajamani, Ravi; Minto, Karl D.; Bulkley, Benjamin E.; and Norman, Bruce G., 5,487,265, Cl. 60-39.030.
Norman, Colin F. W.: *See*—
Evans, Christopher M.; and Norman, Colin F. W., 5,487,951, Cl. 428-523.000.
Norris, Philip R., to Polaroid Corporation. Camera back adapter and method. 5,488,444, Cl. 354-83.000.
North, Bernard F.: *See*—
Dragner, Louis R.; and North, Bernard F., 5,488,139, Cl. 560-155.000.
North Carolina State University: *See*—
Baliga, B. Jayant; and Korec, Jacek, 5,488,236, Cl. 257-132.000.
Glass, Jeffrey T.; Simendinger, Denise T.; and Goeller, Peter T., 5,488,232, Cl. 257-77.000.
Yang, Peichun; Zhu, Wei; and Glass, Jeffrey T., 5,487,945, Cl. 428-408.000.
Northern Telecom Limited: *See*—
Bielby, Gregory J.; Gupta, Vishwa N.; Hodgson, Lauren C.; Lennig, Matthew; Sharp, R. Douglas; and Wasmeier, Hans A., 5,488,652, Cl. 379-88.000.
Mistry, Balwantrai; and Wallace, Raymond B., 5,488,541, Cl. 361-788.000.
Ozkan, Oguz, 5,488,641, Cl. 375-374.000.
Wu, Chi, 5,488,679, Cl. 385-15.000.
Northrop Grumman Corporation: *See*—
Bartilucci, Anthony R.; Gilchrist, George W.; and Yurman, Richard, 5,487,864, Cl. 264-219.000.
Star, Albert A.; and Carbone, Anthony T., 5,487,681, Cl. 439-581.000.
Norton, Karen J.: *See*—
Norton, Richard L.; and Norton, Karen J., 5,488,713, Cl. 395-500.000.
Norton, Paul F.; and Shaffer, James E., to Solar Turbines Incorporated. Turbine nozzle positioning system. 5,487,642, Cl. 415-209.200.
Norton, Richard L.; and Norton, Karen J., to Digital Equipment Corporation. Computer simulation technique for predicting program performance. 5,488,713, Cl. 395-500.000.
Norton, Richard L.: *See*—
Polson, Alan M.; Swanbom, Deryl D.; Dunn, Richard L.; Cox, Charles P.; Norton, Richard L.; Lowe, Bryan K.; and Peterson, Kenneth S., 5,487,897, Cl. 424-426.000.
Nose, Hiroyasu: *See*—
Yamano, Akihiko; Nose, Hiroyasu; Kawase, Toshimitsu; Miyazaki, Toshihiko; and Oguchi, Takahiro, 5,488,602, Cl. 369-126.000.
Novacek, Peter: *See*—
Eroglu, Adnan; Joos, Franz; Novacek, Peter; and Senior, Peter, 5,487,659, Cl. 431-350.000.
Nowak, Michael T.: *See*—
Lewis, Thomas E.; Nowak, Michael T.; Robichaud, Kenneth T.; and Cassidy, Kenneth R., 5,487,338, Cl. 101-454.000.
Nozaki, Hideki; and Unno, Kazumi, to Kabushiki Kaisha Toshiba. Semiconductor light-emitting element and method for manufacturing therefor. 5,488,235, Cl. 257-94.000.
NSK Ltd.: *See*—
Yabe, Toshikazu; Yamamoto, Atsuhiro; Yokouchi, Atsushi; and Esumi, Kunio, 5,487,840, Cl. 252-62.510.
Nuchols, Richard P.: *See*—
Knodel, Bryan D.; Thompson, Bennie; and Nuchols, Richard P., 5,487,500, Cl. 227-181.100.
Numao, Takaji, to Sharp Kabushiki Kaisha. Driving method for a ferroelectric liquid crystal displays having no change data pulses. 5,488,495, Cl. 359-56.000.
Nurenberg, Aundrea: *See*—
Schedegger, Charles E.; Allen, Clyde G.; Clark, Michael C.; Nurenberg, Aundrea; and Wnuk, Jack, 5,487,701, Cl. 454-271.000.
Nussbaumer, Peter; and Stutz, Anton, to Sandoz Ltd. Bis(phenyl)ethane derivatives. 5,488,135, Cl. 560-266.000.
Obermeier, Josef, to Hilti Aktiengesellschaft. Rock drill with conveying groove. 5,487,434, Cl. 175-323.000.
Obrist, Basil, to Erowa AG. Apparatus for clamping a work piece in a well defined position. 5,487,539, Cl. 269-309.000.
Occam Marine Technologies Ltd.: *See*—
Pace, Dan R., 5,487,720, Cl. 494-35.000.
Oda, Zenichi; and Kani, Toshiyuki, to Makita Corporation. Jig saw. 5,487,221, Cl. 30-392.000.
Odell, Peter G., to Xerox Corporation. Processes for the preparation of developer compositions. 5,487,965, Cl. 430-137.000.
Odencrantz, K. C.: *See*—
Hlousek, Louis; Odencrantz, K. C.; Oswald, Richard K.; Dahlin, Donald W.; Motaei, Saied; Siggins, Paul W.; Wong, Kenny; Smith, Ronald A.; and Scheinert, Philip M., 5,488,240, Cl. 250-231.160.
Oehman, Alf: *See*—
Hoegnelid, Kurt; and Oehman, Alf, 5,487,758, Cl. 607-123.000.
Oelkrug, Hans: *See*—
von Ammon, Wilfried; Dornberger, Erich; Oelkrug, Hans; Gerlach, Peter; and Segieth, Franz, 5,487,354, Cl. 117-13.000.
Oetiker, Hans, to Hans Oetiker AG Maschinen- und Apparatefabrik. Self-tightening clamp structure. 5,487,209, Cl. 24-20.00R.
Offen, Walter W.: *See*—
Bodick, Neil C.; Bymaster, Franklin P.; Offen, Walter W.; and Shannon, Harlan E., 5,488,056, Cl. 514-305.000.
Ogata, Yoshihiro: *See*—
Aoki, Masaaki; Yokotsuka, Isao; and Ogata, Yoshihiro, 5,488,266, Cl. 313-509.000.
Ogino, Kazuya; Akahori, Kingo; Harada, Naoki; Kayane, Yutaka; Kawashita, Hideo; and Ohta, Mituhiro, to Sumitomo Chemical Company, Limited. Trisazo compounds, method for dyeing fiber materials, paper or leather using the same and inks containing the same. 5,488,101, Cl. 534-680.000.
Oguchi, Takahiro: *See*—
Yamano, Akihiko; Nose, Hiroyasu; Kawase, Toshimitsu; Miyazaki, Toshihiko; and Oguchi, Takahiro, 5,488,602, Cl. 369-126.000.
Ogura, Masami: *See*—
Takanashi, Hiroshi; Ogura, Masami; and Tanimoto, Masahiro, 5,488,497, Cl. 359-74.000.
Oh, Jun W.: *See*—
Uhm, Sung J.; Han, Sung H.; Oh, Jun W.; and Joo, Oh S., 5,488,143, Cl. 560-232.000.
Oh, Young Jei; Choy, Jin-Ho; Jung, Hyung Jin; Han, Yang Su; and Song, Seung Wan. Method for preparing perpendicularly magnetizable material usable on magnetic recording media. 5,487,878, Cl. 423-140.000.
O'Hair, Dan E., to Enterra Patco Oilfield Products Inc. Rod guide with removable vanes. 5,487,426, Cl. 166-378.000.
Ohashi, Hideki: *See*—
Sato, Osamu; Hayami, Toshihisa; Ohashi, Hideki; Izawa, Makoto; Serizawa, Tomoaki; and Uchida, Hideki, 5,488,546, Cl. 362-61.000.
Ohashi, Shigeo: *See*—
Sato, Kazuo; Shikida, Mitsuhiro; Ohashi, Shigeo; Hatada, Toshio; Ashiwake, Noriyuki; Tanaka, Shinji; Harada, Takeshi; and Honda, Yukio, 5,488,255, Cl. 257-718.000.
Ohgane, Takao: *See*—
Sumikawa, Michito; Koguchi, Yoshihito; Ohgane, Takao; Irie, Yasuo; and Takahashi, Satoji, 5,488,150, Cl. 562-450.000.
Ohki, Naoyuki: *See*—

Fukada, Taisei; Miyata, Masanori; Adachi, Hideki; Nakamura, Shinichi; Ohki, Naoyuki; Kaneko, Tokuharu; Kuroyanagi, Satoshi; Ozaki, Hiroshi; Tahara, Hisatsugu; Kaneko, Satoshi; and Takizawa, Mitsuharu, 5,488,454, Cl. 355-202.000.

Ohki, Sinji, to Daishin Instrument Co., Ltd. Handy computer with built-in digital camera and spot state recording method using the same. 5,488,558, Cl. 364-449.000.

Ohkubo, Masaharu: *See*—
Ojima, Masaki; Ohkubo, Masaharu; Itoh, Michio; Sasame, Hiroshi; Yamada, Hiromichi; Saito, Tetsuo; Kashihara, Atsushi; Kawana, Takashi; Mano, Hiroshi; Seto, Kaoru; and Atobe, Hiroshi, 5,488,487, Cl. 358-456.000.

Ohmi, Tadahiro; Yonekawa, Naomichi; Horiki, Hiroyuki; Kaji, Toshimitsu; Kunimoto, Fumitomo; and Tamaki, Takeo, to Ohmi, Tadahiro; Nisso Engineering Co., Ltd.; and MTC Co., Ltd. Rotary cleaning method with chemical solutions and rotary cleaning apparatus with chemical solutions. 5,487,398, Cl. 134-95.100.

Ohno, Takamasa; Kato, Keietsu; Yamaguchi, Yoshiyuki; Murakami, Masami; Suzuki, Shogo; Kanda, Shoichi; and Nakagawa, Tsuyoshi, to Nitto Chemical Industry Co., Ltd.; and Japan Petroleum Exploration Co., Ltd. Composition and method for recovery of petroleum and gas. 5,487,425, Cl. 166-295.000.

Ohno, Yumiko: *See*—
Yokoyama, Takaaki; Sasaki, Hirotaka; Ohno, Yumiko; Nakajima, Kentaro; Miura, Yasuhiro; and Mori, Hideki, 5,487,903, Cl. 426-56.000.

Ohshima, Keiichi: *See*—
Mochizuki, Seiji; Kawakami, Kazuhisa; Nakamura, Masahiro; Ohshima, Keiichi; and Yoshida, Masanori, 5,488,401, Cl. 347-86.000.

Ohshima, Tetsuya: *See*—
Yamagishi, Toshio; Nanba, Masakazu; Egami, Norifumi; Tanioka, Kenkichi; Kurashige, Mitsuhiro; Tsuji, Kazutaka; Kaneko, Yoshiyuki; Makishima, Tatsuo; Nagatsuma, Kazuyuki; Ohshima, Tetsuya; and Nakano, Yasushi, 5,488,386, Cl. 345-74.000.

Ohta, Hideo: *See*—
Iijima, Takashi; and Ohta, Hideo, 5,487,335, Cl. 101-181.000.

Ohta, Mituhiro: *See*—
Ogino, Kazuya; Akahori, Kingo; Harada, Naoki; Kayane, Yutaka; Kawashita, Hideo; and Ohta, Mituhiro, 5,488,101, Cl. 534-680.000.

Ohta, Yutaka; and Nagoya, Takatoshi, to Shin-Etsu Handotai Co., Ltd. Apparatus for growing silicon epitaxial layer. 5,487,358, Cl. 117-200.000.

Ohtsu, Keiji: *See*—
Uno, Yoichiro; Takeno, Fumio; Yamatoya, Kazuhiko; and Ohtsu, Keiji, 5,488,105, Cl. 536-128.000.

Ohtsubo, Toshiro: *See*—
Yamada, Masahiro; Katayama, Yasuyuki; and Ohtsubo, Toshiro, 5,488,043, Cl. 514-120.000.

Oi, Nakao; and Komatsuzaki, Hiroshi, to Fuji Photo Film Co., Ltd. Lens-fitted photographic film package and production method therefor. 5,488,445, Cl. 354-106.000.

Oikawa, Ryuetsu: *See*—
Seki, Yoshinobu; Kawaguchi, Kenichiro; Oozono, Gen; Sugiyama, Akio; and Oikawa, Ryuetsu, 5,488,345, Cl. 337-186.000.

Ojima, Masaki; Ohkubo, Masaharu; Itoh, Michio; Sasame, Hiroshi; Yamada, Hiromichi; Saito, Tetsuo; Kashihara, Atsushi; Kawana, Takashi; Mano, Hiroshi; Seto, Kaoru; and Atobe, Hiroshi, to Canon Kabushiki Kaisha. Image forming apparatus, and modulating method therein. 5,488,487, Cl. 358-456.000.

Okabe, Naoko: *See*—
Sunouchi, Kazumasa; Takato, Hiroshi; Ozaki, Tohru; Okabe, Naoko; Hieda, Katsuhiko; Horiguchi, Fumio; Nitayama, Akihiro; Yamada, Takashi; Hasimoto, Kouji; and Inoue, Satosi, 5,488,242, Cl. 257-301.000.

Okada, Hiroshi; and Shima, Hisato, to Sony Corporation. Apparatus for generating a composite video signal. 5,488,481, Cl. 358-319.000.

Okada, Keiichi: *See*—
Kawanishi, Shinya; Furuta, Kouichi; and Okada, Keiichi, 5,488,468, Cl. 356-4.010.

Okada, Masaki, to Fujitsu Limited; and Fujitsu VLSI Limited. Supply voltage generator. 5,488,327, Cl. 327-536.000.

Okamoto, Hiroshi: *See*—
Chida, Atsushi; Sannomiya, Hitoshio; Nomoto, Katsuhiko; Okamoto, Hiroshi; and Yamamoto, Yoshihiro, 5,487,786, Cl. 118-723.00E.

Okamoto, Masaya: *See*—
Umeda, Takashi; and Okamoto, Masaya, 5,488,086, Cl. 525-92.00A.

Okano, Yoshiaki: *See*—
Ishikawa, Masaaki; Iguchi, Michihisa; Hashizume, Hiroshi; Nakamura, Tetsuya; Satou, Kouichirou; Okano, Yoshiaki; Fukuyama, Hirotaka; Katagata, Satoshi; Ishikawa, Takashi; Arai, Seiji; Sakai, Chinobu; and Kabai, Takahito, 5,488,462, Cl. 355-215.000.

Okawa, Kazuhiro: *See*—
Yoshii, Shigeo; Okawa, Kazuhiro; Tsujimura, Ayumi; and Mitsuyu, Tsuneo, 5,488,234, Cl. 257-94.000.

O'Keefe, Dennis J.: *See*—
Young, Eugene F.; and O'Keefe, Dennis J., 5,487,841, Cl. 252-62.590.

Oki Telecom: *See*—
De Loe, John P., Jr., 5,488,332, Cl. 331-25.000.

Oklahoma Medical Research Foundation: *See*—
Carney, John M., 5,488,145, Cl. 562-62.000.

Okuyama, Yuzo: *See*—
Kakuma, Satoshi; Yoshimura, Shuji; Hajikano, Kazuo; Murayama, Masami; and Okuyama, Yuzo, 5,488,606, Cl. 370-16.000.

Olds, Keith A.: *See*—
Redden, James P.; Terris, David; and Olds, Keith A., 5,488,640, Cl. 375-357.000.

O'Lenick, Anthony J., Jr., to Siltech Inc. Di-guerbet esters. 5,488,121, Cl. 554-167.000.

Oleo International Holdings Limited: *See*—
Page, Ronald C.; Bushnell, John J.; and Williams, Terence D., 5,487,480, Cl. 213-43.000.

Olin Corporation: *See*—
Mason, Robert W., 5,488,187, Cl. 568-932.000.

Oliver, David C.; and Petrillo, Michael J. Rasterization of line segments using difference vectors. 5,488,698, Cl. 395-110.000.

Oliver, Stewart W., to Telegenics, Inc. Telemetry device including a dynamic off-hook detector capable of operationg in a pulse-dialing environment. 5,488,654, Cl. 379-106.000.

Olmstead, Thomas A.; Gonzalez, Michael A.; Orvik, Jon A.; Pearson, Douglas L.; Ringer, James W.; Shiang, Dawn; Tai, Jimmy J.; and Wallin, Anne P., to DowElanco. 5-alkoxy[1,2,4]triazolo[1,5-c]pyrimidine-2(3H)—thione compounds and their use in the preparation of and 2-chlorosulfonyl-5-alkoxy[1,2,4]triazolo[1,5-c]-pyrimidine compounds. 5,488,109, Cl. 544-263.000.

Olsen, Mark W.; Powell, Joe R.; Tharp, Russell C.; and Walter, Stephen A., to Lennox Industries Inc. Electric heat control apparatus and method. 5,488,218, Cl. 219-492.000.

Olson, William J.: *See*—
Orrico, Mario M. V.; Olson, William J.; Zielinski, James S.; and Crippen, Randall M., 5,488,209, Cl. 200-61.700.

Olympus Optical Co., Ltd.: *See*—
Uno, Masayuki, 5,488,415, Cl. 348-241.000.
Yabe, Hisao; Iida, Yoshihiro; Suzuki, Akira; Ito, Hideo; Tashiro, Yoshio; Yamazaki, Minoru; and Tamada, Osamu, 5,487,376, Cl. 600-121.000.

Omniglow Corporation: *See*—
Ladyjensky, Jacques, 5,488,544, Cl. 362-34.000.

Omori, Kenji: *See*—
Shibatani, Takeji; Komatsubara, Saburo; Omori, Kenji; and Akatsuka, Hiroyuki, 5,487,996, Cl. 435-252.100.

Omori, Takuro: *See*—
Maeda, Hiroshi; and Omori, Takuro, 5,488,387, Cl. 345-89.000.

Omron Corporation: *See*—
Kanai, Hirokazu, 5,487,340, Cl. 101-486.000.
Makita, Shigeru; Sano, Yoshihiko; Nakamura, Yasushi; and Ota, Hiroyuki, 5,487,607, Cl. 374-158.000.
Yamamoto, Koji; Hanafusa, Masahiro; Onuma, Fumio; and Nishimura, Michio, 5,488,469, Cl. 356-72.000.

Omura, Naoki; Igarashi, Minoru; Inoue, Yoshio; and Takahashi, Masaharu, to Shin-Etsu Chemical Co., Ltd. Method for manufacturing organosilanes having silanol groups. 5,488,125, Cl. 556-463.000.

O'Neal, Clifford: *See*—
Lyon, Sue B.; O'Neal, Clifford; Van Der Lee, Hermes; and Rogers, Brian, 5,487,886, Cl. 424-65.000.

Ong, Adrian E.; Waller, William K.; and Zagar, Paul S., to Micron Technology, Inc. Memory integrated circuits having on-chip topology logic driver, and methods for testing and producing such memory integrated circuits. 5,488,583, Cl. 365-201.000.

Onishi, Hiroshi: *See*—
Takahashi, Kenichi; Takeishi, Minako; and Onishi, Hiroshi, 5,488,629, Cl. 375-206.000.

Onishi, Ken: *See*—
Ueda, Tomohiro; Iotow, Takashi; Asamura, Yoshinori; Onishi, Ken; and Mishima, Hidetoshi, 5,488,482, Cl. 358-339.000.

Onishi, Masanori: *See*—
Nishikawa, Yuji; and Onishi, Masanori, 5,488,277, Cl. 318-587.000.

Onitsuka, Yoshihiro: *See*—
Taniguchi, Osamu; Inoue, Hiroshi; Mizutome, Atsushi; Mihara, Tadashi; Onitsuka, Yoshihiro; and Terada, Masahiro, 5,488,388, Cl. 345-97.000.

Onomura, Masaaki: *See*—
Ishikawa, Masayuki; Nishikawa, Yukie; Saito, Shinji; Parbrook, Peter J.; Onomura, Masaaki; Nitta, Koichi; and Hatakoshi, Genichi, 5,488,233, Cl. 257-94.000.

Onufry, Michael, Jr.: *See*—
Dimolitsas, Spiros; Onufry, Michael, Jr.; and Rieser, Jack H., 5,488,653, Cl. 379-100.000.

Onuma, Fumio: *See*—
Yamamoto, Koji; Hanafusa, Masahiro; Onuma, Fumio; and Nishimura, Michio, 5,488,469, Cl. 356-72.000.

Onuma, Sei: *See*—
Sawada, Kenji; Yamade, Yashushi; and Onuma, Sei, 5,488,490, Cl. 358-487.000.

Ooenoki, Toshiyuki, to Kabushiki Kaisha Komatsu Seisakusho. Bending angle detector for use in a bending machine. 5,488,470, Cl. 356-138.000.

Oorui, Satoshi: *See*—
Sakamoto, Mitsuo; Koshika, Norihide; Nishimura, Isao; Sasaki, Katsuyasu; and Oorui, Satoshi, 5,487,534, Cl. 267-141.100.

Oosawa, Hidefumi: *See*—
Katayama, Akihiro; and Oosawa, Hidefumi, 5,488,673, Cl. 382-270.000.

Oostlander, Klaas: *See*—
Rudolph, Bernd; Dietz, Klaus J.; and Oostlander, Klaas, 5,488,267, Cl. 315-63.000.

Oozono, Gen: *See*—

Seki, Yoshinobu; Kawaguchi, Kenichiro; Oozono, Gen; Sugiyama, Akio; and Oikawa, Ryuetsu, 5,488,345, Cl. 337-186.000.
Opperthauser, Mark R.: *See*—
Bauer, Fred P.; Sanders, Stuart E.; Van Wagener, Raymond H.; and Opperthauser, Mark R., 5,488,268, Cl. 315-70.000.
Ordentlich, Erik: *See*—
Shpiro, Zeev; Groner, Gabriel F.; and Ordentlich, Erik, 5,487,671, Cl. 434-185.000.
Oriel, Patrick J.: *See*—
Chang, Hae C.; and Oriel, Patrick J., 5,487,988, Cl. 435-147.000.
Orita, Yasuhide: *See*—
Shigetaka, Hiroshi; and Orita, Yasuhide, 5,488,210, Cl. 200-344.000.
Ormat Turbines (1965) Ltd.: *See*—
Kedar, Alon; and Zimron, Ohad, 5,487,765, Cl. 55-310.000.
OroAmerica, Inc.: *See*—
Strobel, Kalman, 5,487,264, Cl. 59-80.000.
Orrico, Mario M. V.; Olson, William J.; Zielinski, James S.; and Crippen, Randall M., to Illinois Tool Works Inc. Hinge operated switch assembly. 5,488,209, Cl. 200-61.700.
Orthomerica Products, Inc.: *See*—
Schwenn, Shannon R., 5,487,724, Cl. 602-20.000.
Orvik, Jon A.: *See*—
Olmstead, Thomas A.; Gonzalez, Michael A.; Orvik, Jon A.; Pearson, Douglas L.; Ringer, James W.; Shiang, Dawn; Tai, Jimmy J.; and Wallin, Anne P., 5,488,109, Cl. 544-263.000.
Osakabe, Yoshio: *See*—
Sato, Makoto; Yamazaki, Hiroshi; Kotabe, Noriko; Osakabe, Yoshio; Kusagaya, Yasuo; Tanaka, Shigeo; Sugiyama, Kouich; and Katsuyama, Akira, 5,488,357, Cl. 340-825.250.
Osborn, John D., to Encore Technologies, Inc. Rubber and plastic bonding. 5,488,080, Cl. 524-270.000.
Osborn, Kevin O.: *See*—
Otto, John G., III; Vanderwall, Ronald W.; Hamilton, Eugene R.; and Osborn, Kevin O., 5,487,289, Cl. 70-279.000.
Osborne, William E.; Waterman, Harold J., Jr.; and Findlay, David, to Marlin Firearms Company, The. Detonator assembly. 5,487,232, Cl. 42-51.000.
Ose, Takayoshi: *See*—
Sato, Makoto; Ose, Takayoshi; and Aramaki, Satoshi, 5,487,503, Cl. 229-87.050.
Oshio, Susumu; and Igarashi, Tadayuki, to Riso Kagaku Corporation. Stencil printing device equipped with a stencil master plate ejecting device. 5,487,333, Cl. 101-116.000.
Ostroff, Gary R.: *See*—
Jamas, Spiros; Easson, D. Davidson, Jr.; and Ostroff, Gary R., 5,488,040, Cl. 514-54.000.
Ostrover, Lewis S.: *See*—
Lieberfarb, Warren N.; Cookson, Christopher J.; and Ostrover, Lewis S., 5,488,410, Cl. 348-5.500.
Oswald, Richard K.: *See*—
Hlousek, Louis; Odencrantz, K. C.; Oswald, Richard K.; Dahlin, Donald W.; Motaei, Saied; Siggins, Paul W.; Wong, Kenny; Smith, Ronald A.; and Scheinert, Philip M., 5,488,240, Cl. 250-231.160.
Ota, Hiroyuki: *See*—
Makita, Shigeru; Sano, Yoshihiko; Nakamura, Yasushi; and Ota, Hiroyuki, 5,487,607, Cl. 374-158.000.
Ota, Kazuya: *See*—
Mizutani, Hideo; and Ota, Kazuya, 5,488,230, Cl. 250-548.000.
Ota, Yasuo; Enomoto, Masanori; and Abe, Hitoshi, to Nidek Co., Ltd. Portable laser apparatus for ophthalmological operation. 5,488,443, Cl. 351-221.000.
Ota, Yutaka; Iguchi, Yukinobu; and Nakayama, Yoshifumi, to Sony Corporation. Electron gun for color cathode-ray tube. 5,488,264, Cl. 313-412.000.
Otani, Kenji: *See*—
Takada, Kunio; Otani, Kenji; Yamada, Masayuki; Maru, Saburo; Sudo, Sumio; and Tanaka, Sadashi, 5,487,621, Cl. 405-52.000.
Otis Elevator Company: *See*—
Barrett, David W.; McHugh, Thomas M.; Ahigian, Edward E.; Jaminet, Jerome F.; He, Thomas; Peruggi, Richard E.; Kowalcyk, Thomas M.; and Kulak, Richard E., 5,487,449, Cl. 187-330.000.
Hughes, David M.; and Meguerdichian, Gary, 5,487,451, Cl. 187-392.000.
Otomo, Shigeru, to Union Chemical Co., Ltd. Rust inhibitor. 5,487,846, Cl. 252-389.610.
Otsuka, Joji: *See*—
Kabuto, Katsukuni; and Otsuka, Joji, 5,487,439, Cl. 180-79.100.
Otterbein, Stefan; Kunz, Dieter; Kallenbach, Rainer; and Landesfeind, Klaus, to Robert Bosch GmbH. System for generating signals for control or regulation of a chassis controllable or regulable in its sequences of movement. 5,488,562, Cl. 364-424.050.
Otto, David C.: *See*—
Marion, Michael P.; and Otto, David C., 5,487,801, Cl. 156-64.000.
Otto, John G., III; Vanderwall, Ronald W.; Hamilton, Eugene R.; and Osborn, Kevin O., to Herman Miller, Inc. Lock assembly. 5,487,289, Cl. 70-279.000.
Oura, Kazumitsu: *See*—
Ishigaki, Eiichi; Oura, Kazumitsu; and Honda, Takaharu, 5,487,644, Cl. 415-220.000.
Owen Mumford Limited: *See*—
Marshall, Jeremy; and Crossman, David D., 5,487,748, Cl. 606-182.000.
Owens, Carl H. Hydraulic cylinder with end closure assembly. 5,487,326, Cl. 92-128.000.
Oxford Instruments Limited: *See*—
Hanley, Peter, 5,488,342, Cl. 335-306.000.
Oyanagi, Shigeru: *See*—
Tanabe, Noboru; Oyanagi, Shigeru; Baba, Shinichi; Kaminishi, Katsuji; Nakamura, Masaru; and Sekido, Kazunori, 5,488,735, Cl. 395-800.000.
Oyen, Margaret A.; and Baldwin, Linda, to Mill Hill Factory, Inc. Set of blocks for making designs. 5,487,668, Cl. 434-98.000.
Ozaki, Hiroshi: *See*—
Fukada, Taisei; Miyata, Masanori; Adachi, Hideki; Nakamura, Shinichi; Ohki, Naoyuki; Kaneko, Tokuharu; Kuroyanagi, Satoshi; Ozaki, Hiroshi; Tahara, Hisatsugu; Kaneko, Satoshi; and Takizawa, Mitsuharu, 5,488,454, Cl. 355-202.000.
Ozaki, Hiroyasu: *See*—
Kirigaya, Tadayuki; Imakyure, Kaoru; Ozaki, Hiroyasu; and Kurei, Hiroshi, 5,488,446, Cl. 354-289.100.
Ozaki, Takahiro; Munakata, Tomoo; Goto, Fumio; and Tsuchiya, Tetsuo, to Showa Shell Sekiyu K. K. Grease composition for constant velocity joint. 5,487,837, Cl. 252-25.000.
Ozaki, Tohru: *See*—
Sunouchi, Kazumasa; Takato, Hiroshi; Ozaki, Tohru; Okabe, Naoko; Hieda, Katsuhiko; Horiguchi, Fumio; Nitayama, Akihiro; Yamada, Takashi; Hasimoto, Kouji; and Inoue, Satosi, 5,488,242, Cl. 257-301.000.
Ozeki, Masamichi; Takasaki, Mamoru; Miyamoto, Katsuyuki; and Tsuruda, Mitsumasa, to Laurel Bank Machines Co., Ltd. Coin wrapping machine. 5,487,252, Cl. 53-212.000.
Ozkan, Oguz, to Northern Telecom Limited. Digital phase-locked loop circuit. 5,488,641, Cl. 375-374.000.
Pace, Dan R., to Occam Marine Technologies Ltd. Particle concentrator. 5,487,720, Cl. 494-35.000.
Pacesetter, Inc.: *See*—
Renger, Herman L., 5,488,553, Cl. 363-21.000.
Snell, Jeffery D.; Schloss, Harold C.; Mann, Brian M.; Poore, John W.; and Medlin, Roy B., 5,487,754, Cl. 607-27.000.
Snell, Jeffery D.; Schloss, Harold C.; Mann, Brian M.; Poore, John W.; and Medlin, Roy B., 5,487,755, Cl. 607-27.000.
Pack, Bok H., to Goldstar Co., Ltd. Clock-setting apparatus and method utilizing broadcasting character recognition. 5,488,426, Cl. 348-569.000.
Paganin, Maurizio: *See*—
Marchionni, Giuseppe; Guarda, Pier A.; and Paganin, Maurizio, 5,488,181, Cl. 568-615.000.
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Ludden, Michael J.; Penneck, Richard J.; and Smith, Nicholas J. G., 5,487,852, Cl. 264-400.000.
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Restek Corporation: *See—*
Silvis, Paul H.; and Rightmour, Bradley R., 5,487,569, Cl. 285-24.000.
Retallick, William B. Air cleaner capable of catalytic regeneration. 5,487,869, Cl. 422-22.000.
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Cahill, Douglas A.; Brault, Donald A.; Himmelwright, Richard S.; and Taylor, Dene H., 5,488,455, Cl. 355-202.000.
Rey, Henri. Hinge element for a folding support. 5,487,207, Cl. 16-330.000.
Reyes, Bernard. Gas cap construction. 5,487,418, Cl. 141-392.000.
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Brun, Daniel; Lahary, Pierre-Yves; and Thierry, Jean-Francois, 5,488,155, Cl. 562-554.000.
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Rich, Henry H., to Star Technologies, Inc. Dual resolution output system for image generators. 5,488,687, Cl. 395-164.000.
Rich, William L.; and Shackelford, Floyd W., to International Business Machines Corporation. System and method for applying visitor lock and persistent lock flags to control units of work boundaries in an object oriented environment. 5,488,721, Cl. 395-600.000.
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Richardson, Albert S., Jr. Method of spacing transmission line subconductors. 5,488,197, Cl. 174-42.000.
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Richardson, Mary Jane: *See—*
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Ricoh Company, Ltd.: *See—*
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Shimizu, Hiromasa, 5,488,486, Cl. 358-451.000.
Tamura, Hiroshi; Fukagai, Toshio; Mishima, Naoshi; and Sasaki, Masaomi, 5,488,137, Cl. 560-141.000.

Ricoh Co., Ltd.: *See—*
Akiyama, Hiroshi; and Takahashi, Yoshitaka, 5,488,599, Cl. 369-112.000.

Ridgers, Timothy, to U.S. Philips Corporation. Stabilized voltage generator circuit of the band-gap type. 5,488,329, Cl. 327-539.000.

Ridley, Robert L. Vented visor cap. 5,487,191, Cl. 2-195.100.

Riedel, Werner: *See—*
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Dimolitsas, Spiros; Onufry, Michael, Jr.; and Rieser, Jack H., 5,488,653, Cl. 379-100.000.

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Hauner, Friedrich, 5,487,208, Cl. 19-0.250.

Rightnour, Bradley R.: *See—*
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Ringer, James W.: *See—*
Olmstead, Thomas A.; Gonzalez, Michael A.; Orvik, Jon A.; Pearson, Douglas L.; Ringer, James W.; Shiang, Dawn; Tai, Jimmy J.; and Wallin, Anne P., 5,488,109, Cl. 544-263.000.

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Ristic, Ljubisa; Gutteridge, Ronald J.; Koucheng, Wu; Calaway, Michael F.; and Dunn, William C., to Motorola, Inc. Three axes accelerometer. 5,487,305, Cl. 73-514.320.

Ritter, Dale E.: *See—*
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Ritter, Johannes A., to Minnesota Mining & Manufacturing Company. Apparatus for applying coating materials to overlapped individual sheets. 5,487,780, Cl. 118-231.000.

Ritter, Kenneth J.: *See—*
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Rittler, Hermann L., to Corning Incorporated. Cellulated bodies produced from phosphorous polymers. 5,488,016, Cl. 501-39.000.

Rivard, Robert M.; Schneider, Michael J.; Pattantyus, Tamas I.; Towers, Kenneth S.; and Phipps, Jack R., to AlliedSignal Inc. Variable duty cycle antilock braking system with accelerometer. 5,487,598, Cl. 303-166.000.

Rivera, David F.; Floyd, Thomas R.; and Josypenko, Michael J., to United States of America, Navy. Broadband waveguide pressure window. 5,488,336, Cl. 333-252.000.

Riverwood International Corporation: *See—*
Harris, Randall L., 5,487,463, Cl. 206-145.000.

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Luciani, Carmen V.; and Rizvi, Syed Q. A., 5,487,838, Cl. 252-49.900.
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RJS, Inc.: *See—*
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Robbins, Edward S., III. Dispensing cap with internal measuring chamber and selectively useable sifter. 5,487,494, Cl. 222-158.000.

Robert Bosch GmbH: *See—*
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Otterbein, Stefan; Kunz, Dieter; Kallenbach, Rainer; and Landesfeind, Klaus, 5,488,562, Cl. 364-424.050.

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Roberts, Rodney W.: *See—*
Drummond, Michael T.; Hill, Calvin G.; Lowman, Richard M., Jr.; Suski, William C.; Roberts, Rodney W.; and Lowry, James W., 5,487,506, Cl. 229-202.000.

Robertshaw Controls Company: *See—*
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Robertson, Duane D. Pipe fitting. 5,487,571, Cl. 285-259.000.

Robertson, Neil L.: *See—*
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Robertson, Paul A.; Houzego, Peter J.; Jensen, Borge R.; Creeke, Murray A.; Emerton, Neil; Hodson, Peter D.; and Baum, Eric A., to Minnesota Mining and Manufacturing Company. Inhaler. 5,487,378, Cl. 128-200.160.

Robichaud, Kenneth T.: *See—*
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Robinson, Shaughnessy: *See—*
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Robson, Jerry A. Desktop accessories holder. 5,487,466, Cl. 206-214.000.

Rocheleau, Lawrence W. Handled closure device. 5,487,482, Cl. 215-396.000.

Rockwell International Corporation: *See—*
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Rodel, Inc.: *See—*
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Roe, Paul J.: *See—*
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Roehm GmbH Chemische Fabrik: *See—*
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Rogers, Stephen D.: *See—*
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Kim, Jung H.; Chung, Hae Y.; Kim, Hyung S.; Lee, Byeong H.; and Roh, Young H., 5,487,284, Cl. 68-3.0SS.

Rohm and Haas Company: *See—*
Bauer, William, Jr.; Quiros, Nelson I.; and Upmacis, Rita K., 5,488,141, Cl. 560-218.000.

Rohm Co., Ltd.: *See—*
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Rosenburgh, John H.: *See—*
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Roshdy, Constance; and Johnson, E. Paul, to Ethicon, Inc. Package for endoscopic instrument. 5,487,469, Cl. 206-363.000.

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Ross Technology, Inc.: *See—*
Vegesna, Anantakotiraju; Avula, Jayachandra B.; Jewett, Peter H.; and Mundkur, Yatin G., 5,488,729, Cl. 395-800.000.

Rotech Tooling: *See—*
Aronsson, Joachim, 5,488,215, Cl. 219-86.250.

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Rothaus, Robert J.: *See—*
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Rothmans, Benson & Hedges Inc.: *See—*
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Rowden, David L.: *See—*
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Rowe McIntyre, Katherine: *See—*
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Rowley, Janet D.; and Diaz, Manuel O., to Arch Development Corp. Compositions and methods for detecting gene rearrangements and translocations. 5,487,970, Cl. 435-6.000.

Roy, Timothy A.: *See—*

Mackerer, Carl R.; Roy, Timothy A.; and Blackburn, Gary R., 5,488,193, Cl. 585-455.000.

Rozman, Gregory I.; Markunas, Albert L.; Hanson, Michael J.; and Weber, Leland E., to Sundstrand Corporation. Method and apparatus for starting a synchronous machine. 5,488,286, Cl. 322-10.000.

RPM Industries, Inc.: *See—*
Mueller, Roger P.; Mueller, Roy P.; Nemeth, Joe; and Schoning, Robert, 5,487,198, Cl. 12-117.400.

Rubi, Horst, to Scangraphic PrePress Technology GmbH. Method and apparatus for the exposing of light-sensitive material to be exposed. 5,488,406, Cl. 347-259.000.

Rubscha, Robert F.: *See—*
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Rudolph, Bernd; Dietz, Klaus J.; and Oostlander, Klaas, to Heraeus Xenotest GmbH. Xenon lamp system for materials testing apparatus. 5,488,267, Cl. 315-63.000.

Ruehl, Phillip C.; Kretschmer, Stephen L.; and Behrmann, Richard J., to A. O. Smith Corporation. Method of manufacturing engine cradles. 5,487,219, Cl. 29-897.000.

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Rumm, Dieter: *See—*
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Rupprecht & Patashnick Company, Inc.: *See—*
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Rusincovitch, George, Jr.; and Roe, Paul J., to Borden, Inc. Repositionable wall covering. 5,487,929, Cl. 428-40.000.

Russ, Timothy J.; Khatib, Khal M.; and Baker, Jay O., to Moore Business Forms, Inc. Perforating blade/label perforating. 5,487,915, Cl. 427-208.000.

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Rutten, Matthew J.: *See—*
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Ryan, Dale; and Kootte, Eric, to Whitaker Corporation, The. Crimping tool having mechanism for selectively biasing crimping dies to open or closed position. 5,487,297, Cl. 72-450.000.

Ryan, Dale W.: *See—*
Merle, Thomas C.; Ryan, Dale W.; Slater, Walter C.; Rowden, David L.; Sherman, Gerald F., Jr.; and Ianni, Alfonso, 5,488,448, Cl. 354-313.000.

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Rye, Robert A. Transfer case stand. 5,487,537, Cl. 269-51.000.

Ryu, Tadamitsu; Kakehi, Gen; and Aoe, Shigeru, to Fujitsu Network Engineering Limited. Automatic support tool generating system based on a knowledge acquisition tool and a database. 5,488,732, Cl. 395-800.000.

Sabbe, Luc: *See—*
De Waegenaere, Johan; Sabbe, Luc; and Van Giel, Frans, 5,487,262, Cl. 57-58.650.

Sackmann, Günter: *See—*
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Sadayori, Toshio: *See—*
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Saeva, Franklin D.: *See—*
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Safe-T-Limited: *See—*
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Safferman, Steven I.; and Bishop, Paul L., to United States of America, Administrator of the United States Environmental Protection Agency; and University of Cincinnati, The. Internal media cleaning device for aerobic fluidized bed reactors. 5,487,829, Cl. 210-151.000.

Saiki, Randall K.: *See—*
Gelfand, David H.; Holland, Pamela M.; Saiki, Randall K.; and Watson, Robert M., 5,487,972, Cl. 435-6.000.

Saindon, Stephen A.; Heindel, Kevin O.; and Morrow, James G., to CMD Corporation. Apparatus and method for detecting a heat seal in a moving plastic film. 5,488,480, Cl. 356-429.000.

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Saito, Shinichiro, to Konica Corporation. Light beam scanning device and image formation lens. 5,488,502, Cl. 359-205.000.

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Saito, Tetsuo: *See—*
Ojima, Masaki; Ohkubo, Masaharu; Itoh, Michio; Sasame, Hiroshi; Yamada, Hiromichi; Saito, Tetsuo; Kashihara, Atsushi; Kawana, Takashi; Mano, Hiroshi; Seto, Kaoru; and Atobe, Hiroshi, 5,488,487, Cl. 358-456.000.

Saitoh, Tadashi: *See—*
Takeuchi, Takashi; Saitoh, Tadashi; Matsunaga, Toshihiro; Mori, Masashi; and Fujiya, Hajime, 5,488,595, Cl. 369-54.000.

Saitou, Tosiaki, to NEC Corporation. Coaxial cable terminal processing tool and processing method of the same. 5,487,220, Cl. 30-90.600.

Sakai, Chinobu: *See—*
Ishikawa, Masaaki; Iguchi, Michihisa; Hashizume, Hiroshi; Nakamura, Tetsuya; Satou, Kouichirou; Okano, Yoshiaki; Fukuyama, Hirotaka; Katagata, Satoshi; Ishikawa, Takashi; Arai, Seiji; Sakai, Chinobu; and Kabai, Takahito, 5,488,462, Cl. 355-215.000.

Sakamoto, Hiroshi; Tamura, Hideki; and Furukawa, Kaoru, to Sakamoto, Hiroshi; and Matsushita Electric Works. Inverter power supply. 5,488,552, Cl. 363-21.000.

Sakamoto, Mitsuo; Koshika, Norihide; Nishimura, Isao; Sasaki, Katsuyasu; and Oorui, Satoshi, to Kajima Corporation. Laminated rubber vibration control device for structures. 5,487,534, Cl. 267-141.100.

Sakano, Shinichi; Aoki, Daigo; Utsumi, Minoru; Akada, Masanori; and Shimizu, Osamu, to Dai Nippon Printing Co., Ltd. Photoelectric sensor, information recording system, and information recording method. 5,488,601, Cl. 369-120.000.

Sakashita, Hiroshi; and Arasaki, Eiji, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Disk drive device having a spindle motor and a head carriage section both provided in a disk cassette loading area. 5,488,526, Cl. 360-106.000.

Sakaya, Yoshihiro: *See—*
Sawada, Susumu; Anan, Junichi; Nakamura, Hiroki; and Sakaya, Yoshihiro, 5,487,823, Cl. 204-298.120.

Sakurai, Mikio, to Mitsubishi Denki Kabushiki Kaisha. MOS-type semiconductor clamping circuit. 5,488,247, Cl. 257-368.000.

Sakuwa, Makoto: *See—*
Takemura, Taketoshi; Sakuwa, Makoto; and Watanuki, Haruo, 5,488,263, Cl. 313-402.000.

Salant, Richard F.; Green, Itzhak; Hufford, Larry A.; and Giles, Oley, to BW/IP International, Inc. Secondary gas/liquid mechanical seal assembly. 5,487,550, Cl. 277-65.000.

Sale, Matthew D.: *See—*
Wise, William D.; De Wever, Marc L.; Kumke, Dale J.; Lumpkin, Everett R.; Sale, Matthew D.; and Schousek, Brian W., 5,487,595, Cl. 303-168.000.

Sall, Daniel J.; and Shuman, Robert T., to Eli Lilly and Company. Antithrombotic agents. 5,488,037, Cl. 514-19.000.

Salling, Bo, to Scanbur A/S. Door operating mechanism. 5,487,574, Cl. 292-218.000.

Salo, Rodney W.; Spinelli, Julio C.; and Tockman, Bruce A., to Cardiac Pacemakers, Inc. Automated programmable stimulating device to optimize pacing parameters and method. 5,487,752, Cl. 607-17.000.

Salsburg, Fredric S.; and Fairbrother, Matthew D., to Eastman Kodak Company. Apparatus and method for loading rolls of web into a chamber. 5,487,638, Cl. 414-796.900.

Salsman, Jeffrey S.: *See—*
Williamson, Calvin C.; and Salsman, Jeffrey S., 5,487,299, Cl. 73-12.090.

Salter, Russell D., to University of Pittsburgh. Method of obtaining immunogenic peptides from cells expressing temperature-sensitive mutants of major histocompatibility complex molecules. 5,487,982, Cl. 435-69.100.

Sampath, Lester: *See—*
Modak, Shanta; and Sampath, Lester, 5,487,896, Cl. 424-402.000.

Samsung Electronics Co., Ltd.: *See—*
Cho, Nam-Sik, 5,488,259, Cl. 310-91.000.
Choi, Soon C.; and Jeon, Ki U., 5,488,436, Cl. 348-751.000.
Han, Min-Ku; and Min, Byung-Hyuk, 5,488,005, Cl. 437-41.000.
Hwang, Humor; and Lee, Myeong-hwan, 5,488,421, Cl. 348-448.000.
Jeong, Jechang; and Shin, Hyunsoo, 5,488,637, Cl. 375-341.000.
Joo, Ho-gul, 5,488,449, Cl. 354-402.000.
Jung, Tae-Hong, 5,488,434, Cl. 348-725.000.
Kim, Kyeong-Tae; Shin, Yun-seung; Park, Young-hun; Park, Won-mo; and Ahn, Ji-hong, 5,488,007, Cl. 437-47.000.
Park, Soon-Kyu, 5,488,580, Cl. 365-189.050.

Sanberg, Paul R.: *See—*
Aebischer, Patrick; Goddard, Moses; Moldauer, John G.; Mulhauser, Paul J.; Rathbun, Anne M.; Sanberg, Paul R.; Vasconcellos, Alfred V.; and Warner, Nicholas F., 5,487,739, Cl. 604-890.100.

Sander, Dieter; and Meyer, Uwe F. Tamper evident plastic closure. 5,487,481, Cl. 215-252.000.

Sanders, Stuart E.: *See—*
Bauer, Fred P.; Sanders, Stuart E.; Van Wagener, Raymond H.; and Opperthauser, Mark R., 5,488,268, Cl. 315-70.000.

Sandoz Ltd.: *See—*
Nussbaumer, Peter; and Stutz, Anton, 5,488,135, Cl. 560-266.000.
Staniek, Peter, 5,488,079, Cl. 524-116.000.

Sandquist, Axel: *See—*
Thurm, Siegfried; Sommer, Klaus; Bier, Peter; Elschner, Andreas; Kowitz, Manfred; and Sandquist, Axel, 5,487,810, Cl. 216-67.000.

Sandstrom, Paul H., to Goodyear Tire & Rubber Company, The. Sulfur cured rubber composition containing epoxidized natural rubber and carboxylated nitrile rubber. 5,488,077, Cl. 523-438.000.

Sandvik AB: *See—*

Ljungberg, Bjorn; and Lenander, Anders, 5,487,625, Cl. 407-119.000.
Von Holst, Peder; and Giessler, Josef, 5,487,626, Cl. 408-144.000.
Sannomiya, Hitoshio: *See*—
Chida, Atsushi; Sannomiya, Hitoshio; Nomoto, Katsuhiko; Okamoto, Hiroshi; and Yamamoto, Yoshihiro, 5,487,786, Cl. 118-723.00E.
Sano, Yoshihiko: *See*—
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Sanofi: *See*—
Barbier, Alain; and Lacheretz, Frederic, 5,488,041, Cl. 514-108.000.
Bareni, Marco; Cecchi, Roberto; and Croci, Tiziano, 5,488,151, Cl. 562-452.000.
Sanofi Winthrop Inc.: *See*—
Kumar, Virendra; and Dority, John A., Jr., 5,488,055, Cl. 514-293.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Sumigawa, Yukio, 5,487,688, Cl. 440-88.000.
Sansone, Arthur J.; and Braginsky, Asik, to Conair Corporation. Blender blades and system adapted for ice crushing. 5,487,511, Cl. 241-282.100.
Santasalo, Lauri, to Fisn-Aqua Santasalo-Sohlberg Oy. Method for distilling and sterilizing feed water. 5,487,814, Cl. 203-2.000.
Santel, Hans-Joachim: *See*—
Haas, Wilhelm; Müller, Klaus-Helmut; König, Klaus; Santel, Hans-Joachim; Lürssen, Klaus; and Schmidt, Robert R., 5,488,028, Cl. 504-193.000.
Sanyo Electric Co., Ltd.: *See*—
Fujimoto, Mitsuo, 5,488,704, Cl. 395-228.000.
Sanyo Vacuum Industries Co, Ltd.: *See*—
Takanashi, Hiroshi; Ogura, Masami; and Tanimoto, Masahiro, 5,488,497, Cl. 359-74.000.
Sanzari, Martin A., to Kearfott Guidance and Navigation Corporation. Superconducting dual junction gyroscope apparatus. 5,487,304, Cl. 73-504.070.
Saraf, Anil W., to BASF Corporation. Process for the manufacture of a post-heat set dyed fabric of polyamide fibers having improved dye washfastness and heat stability. 5,487,856, Cl. 264-78.000.
Sarjeant, Malcolm: *See*—
Tindall, David; and Sarjeant, Malcolm, 5,488,355, Cl. 340-578.000.
Sasago, Yoshikazu: *See*—
Tsuda, Tadayuki; Sekine, Kazumi; Ikemoto, Isao; Watanabe, Kazushi; Sasago, Yoshikazu; Shimizu, Yasushi; Noda, Shinya; and Kobayashi, Kazunori, 5,488,459, Cl. 355-211.000.
Sasaki, Hirotaka: *See*—
Yokoyama, Takaaki; Sasaki, Hirotaka; Ohno, Yumiko; Nakajima, Kentaro; Miura, Yasuhiro; and Mori, Hideki, 5,487,903, Cl. 426-56.000.
Sasaki, Katsuyasu: *See*—
Sakamoto, Mitsuo; Koshika, Norihide; Nishimura, Isao; Sasaki, Katsuyasu; and Oorui, Satoshi, 5,487,534, Cl. 267-141.100.
Sasaki, Kazuo: *See*—
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Sasaki, Masaomi: *See*—
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Tamura, Hiroshi; Fukagai, Toshio; Mishima, Naoshi; and Sasaki, Masaomi, 5,488,137, Cl. 560-141.000.
Sasaki, Mitsuo, to Unisia Jecs Corporation. Apparatus and method for independently controlling damping force characteristic of vehicular shock absorber. 5,488,556, Cl. 364-424.050.
Sasame, Hiroshi: *See*—
Ojima, Masaki; Ohkubo, Masaharu; Itoh, Michio; Sasame, Hiroshi; Yamada, Hiromichi; Saito, Tetsuo; Kashihara, Atsushi; Kawana, Takashi; Mano, Hiroshi; Seto, Kaoru; and Atobe, Hiroshi, 5,488,487, Cl. 358-456.000.
Satake Corporation: *See*—
Satake, Satoru; Inaashi, Tadanobu; and Ito, Takafumi, 5,487,472, Cl. 209-581.000.
Satake, Satoru; Inaashi, Tadanobu; and Ito, Takafumi, to Satake Corporation. Color sorter for sorting out moldy pulse. 5,487,472, Cl. 209-581.000.
Sato, Kazuma: *See*—
Go, Shintetsu; Kashizaki, Yoshio; Suzuki, Koichi; Sato, Kazuma; and Shimada, Akira, 5,488,461, Cl. 355-211.000.
Sato, Kazuo; Shikida, Mitsuhiro; Ohashi, Shigeo; Hatada, Toshio; Ashiwake, Noriyuki; Tanaka, Shinji; Harada, Takeshi; and Honda, Yukio, to Hitachi, Ltd. Cooling device for semiconductor packages, having flexible film heat expulsion means. 5,488,255, Cl. 257-718.000.
Sato, Makoto; Ose, Takayoshi; and Aramaki, Satoshi, to Fuji Photo Film Co., Ltd. Wrapped article with tear slits. 5,487,503, Cl. 229-87.050.
Sato, Makoto; Yamazaki, Hiroshi; Kotabe, Noriko; Osakabe, Yoshio; Kusagaya, Yasuo; Tanaka, Shigeo; Sugiyama, Kouich; and Katsuyama, Akira, to Sony Corporation. Remote controlling method and system feature starting method and controlling method for audio/visual system. 5,488,357, Cl. 340-825.250.
Sato, Masatoshi; and Masuda, Noriyuki, to Advantest Corporation. Timing generator intended for semiconductor testing apparatus. 5,488,325, Cl. 327-286.000.
Sato, Osamu; Hayami, Toshihisa; Ohashi, Hideki; Izawa, Makoto; Serizawa, Tomoaki; and Uchida, Hideki, to Koito Manufacturing Co., Ltd. Color-changing lamp for vehicle. 5,488,546, Cl. 362-61.000.
Sato, Taizo; and Fujihira, Atsushi, to Fujitsu Limited. Cache memory and data processor including instruction length decoding circuitry for simultaneously decoding a plurality of variable length instructions. 5,488,710, Cl. 395-452.000.
Sato, Yuzuru: *See*—
Tanaka, Takaaki; and Sato, Yuzuru, 5,488,499, Cl. 359-102.000.
Satoh, Hitoshi: *See*—
Koshigoe, Taichi; Satoh, Hitoshi; and Yamamoto, Kenichi, 5,488,118, Cl. 549-518.000.
Satoh, Masafumi, to Fujitsu Limited. Method for controlling activation of disk drive motors. 5,488,274, Cl. 318-101.000.
Satoh, Shingo: *See*—
Kasahara, Shigeo; Sueoka, Kiyoshi; Takayama, Gen; Satoh, Shingo; and Houjyou, Hidemi, 5,487,417, Cl. 141-32.000.
Satou, Kouichirou: *See*—
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Sattler, Peter: *See*—
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Saukaitis, John C., to Hoechst Celanese Corporation. 8-sulfo-3-quinoline carboxylic acid compounds. 5,488,111, Cl. 546-156.000.
Sauter, Gerald F.; and Stevens, Rick C., to Unisys Corporation. Polymer based optical connector. 5,488,682, Cl. 385-53.000.
Sauvin, Patrick: *See*—
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Sawada, Kenji; Yamade, Yashushi; and Onuma, Sei, to Minolta Camera Kabushiki Kaisha. Image reading apparatus for reading images recorded on film. 5,488,490, Cl. 358-487.000.
Sawada, Susumu; Anan, Junichi; Nakamura, Hiroki; and Sakaya, Yoshihiro, to Japan Energy Corporation. Sputtering targets having life alarm function. 5,487,823, Cl. 204-298.120.
Sawada, Yoshitsugu, to Yazaki Corporation. Pin terminal. 5,487,686, Cl. 439-884.000.
Sawafuji Electric Co., Ltd.: *See*—
Kawamoto, Takato; Gezima, Makoto; and Furuse, Eiichi, 5,488,279, Cl. 318-801.000.
Sawgrass Systems, Inc., a South Carolina Corporation: *See*—
Hale, Nathan S., 5,487,614, Cl. 400-120.020.
Scanbur A/S: *See*—
Salling, Bo, 5,487,574, Cl. 292-218.000.
Scangraphic PrePress Technology GmbH: *See*—
Rubi, Horst, 5,488,406, Cl. 347-259.000.
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Havens, Timothy J.; Tan, Yulan; and Scaturro, John, Jr., 5,488,339, Cl. 335-216.000.
Schafer, Irwin: *See*—
Eckert, Richard L.; Smith, Daniel J.; and Schafer, Irwin, 5,487,889, Cl. 424-93.100.
Schaffner, James H.; and Hammond, Mark B., to Hughes Aircraft Company. Low-power, stabilized, photonic modulator system. 5,488,503, Cl. 359-245.000.
Schakel, Eric G.: *See*—
Matthews, Kent R.; Schakel, Eric G.; and Gamboa, Ricardo R., 5,487,412, Cl. 138-149.000.
Schalk, Petrus W. H.; and Pigmans, Paulus J. M., to Berg Technology, Inc. Electrical contact pin for printed circuit board. 5,487,684, Cl. 439-715.000.
Schardt, Gunter: *See*—
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Schedegger, Charles E.; Allen, Clyde G.; Clark, Michael C.; Nurenberg, Aundrea; and Wnuk, Jack, to Mid-America Building Products Corporation. Plastic foundation vent. 5,487,701, Cl. 454-271.000.
Scheinert, Philip M.: *See*—
Hlousek, Louis; Odencrantz, K. C.; Oswald, Richard K.; Dahlin, Donald W.; Motaei, Saied; Siggins, Paul W.; Wong, Kenny; Smith, Ronald A.; and Scheinert, Philip M., 5,488,240, Cl. 250-231.160.
Schellinger, Michael J., to Motorola, Inc. Method for validating a communication link. 5,488,649, Cl. 379-62.000.
Scherch, Richard P.; and Neer, Robert E., to Grimes Aerospace Company. Windshield wiper blade with securing rod. 5,487,205, Cl. 15-250.310.
Scherer, Klaus: *See*—
Schollkopf, Karl-Otto; Böhm, Werner; Kellings, Gerhard; Bollerott, Michael; and Scherer, Klaus, 5,487,448, Cl. 187-247.000.
Scheuble, Bernhard: *See*—
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Scheufeld, Heinz; Lossa, Ulrich; and Stenmans, Heinz, to Palitex Project-Company GmbH. Device for adjusting capsule thread brakes in twisting machines, in particular two-for-one twisters. 5,487,263, Cl. 57-58.860.
Schiel, Christian, to J.M. Voith GmbH. Roll with vibration damper. 5,487,715, Cl. 492-16.000.
Schindler, Eric J. Portable golf putting cup. 5,487,545, Cl. 273-178.00R.
Schirmer, Robert M.: *See*—
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Schleicher, Roland: *See*—
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Schloss, Harold C.: *See*—
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Snell, Jeffery D.; Schloss, Harold C.; Mann, Brian M.; Poore, John W.; and Medlin, Roy B., 5,487,755, Cl. 607-27.000.

Schlösser, Ulrike: *See*—
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Schlueter, Edward L., Jr.: *See*—
Sharf, Lucille M.; Lynd, Laurence J.; Smith, James F.; and Schlueter, Edward L., Jr., 5,487,707, Cl. 474-253.000.

Schlüter, Peter; and Zeuner, Lothar, to Lucas Industries Public Limited Company. Booster housing, especially for vehicle brake systems, and method of assembling such as booster housing. 5,487,327, Cl. 92-128.000.

Schmid, Rudolf: *See*—
Cereghetti, Marco; Foricher, Joseph; Heiser, Bernd; and Schmid, Rudolf, 5,488,172, Cl. 568-13.000.

Schmidt, Dominik: *See*—
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Schmidt, Robert R.: *See*—
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Schmitt, Peter J., to Meadox Medicals, Inc. Process of making self-supporting woven vascular graft. 5,487,858, Cl. 264-103.000.

Schmitter, André: *See*—
Reinehr, Dieter; Bacher, Jean-Pierre; and Schmitter, André, 5,488,112, Cl. 548-261.000.

Schneider, Fred B.; Lampson, Butler; Balkovich, Edward; and Thiel, David, to Digital Equipment Corporation. Fault tolerant computer system with shadow virtual processor. 5,488,716, Cl. 395-182.080.

Schneider, Michael J., to AlliedSignal Inc. Method for updating a wheel reference value by assessing proximity for the braking power curve peak. 5,487,594, Cl. 303-155.000.

Schneider, Michael J.: *See*—
Rivard, Robert M.; Schneider, Michael J.; Pattantyus, Tamas I.; Towers, Kenneth S.; and Phipps, Jack R., 5,487,598, Cl. 303-166.000.

Schnoes, Heinrich K.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; and Aria, Fariba, 5,488,183, Cl. 568-828.000.

Schollkopf, Karl-Otto; Böhm, Werner; Kellings, Gerhard; Bollerott, Michael; and Scherer, Klaus, to Thyssen Aufzuge GmbH; and Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Device for monitoring a control unit. 5,487,448, Cl. 187-247.000.

Scholz, Gerhard: *See*—
Dyllick-Brenzinger, Rainer; Raulfs, Friedrich-Wilhelm; Schlösser, Ulrike; Beck, Karin H.; and Scholz, Gerhard, 5,487,770, Cl. 44-328.000.

Schoning, Robert: *See*—
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Schott, Allan N., to New Holland North America, Inc. Shift fork actuated position sensor. 5,487,318, Cl. 74-606.00R.

Schousek, Brian W.: *See*—
Wise, William D.; De Wever, Marc L.; Kumke, Dale J.; Lumpkin, Everett R.; Sale, Matthew D.; and Schousek, Brian W., 5,487,595, Cl. 303-168.000.

Schriever, Matthias P. Non-chromated oxide coating for aluminum substrates. 5,487,949, Cl. 428-472.100.

Schroff GmbH: *See*—
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Schuler, Wilfried: *See*—
Engelhardt, Fritz; Kühlwein, Jürgen; Schuler, Wilfried; Zerrer, Ralf; and Antwerpen, Werner, 5,488,123, Cl. 556-428.000.

Schuller International, Inc.: *See*—
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Schulthess, Adrian: *See*—
Steinmann, Bettina; Schulthess, Adrian; and Hunziker, Max, 5,487,966, Cl. 430-269.000.

Schultz, Darald R.: *See*—
Danielson, Arvin D.; Schultz, Darald R.; Silva, Dennis; Boatwright, Darrell L.; Austin, Rickey G.; and Alt, Daniel E., 5,488,575, Cl. 364-707.000.

Schulz, Gary J., to Dow Chemical Company, The. Process for comminuting cellulose ethers. 5,488,104, Cl. 536-86.000.

Schulz, Russell C.; Tagamolila, Constante P.; and Bullen, Patrick J., to UOP. Process for the reduction of phenol content in a crude organic stream recovered from a phenol stripper. 5,487,816, Cl. 203-14.000.

Schulz, Stephen C.: *See*—
Sieck, Peter A.; Hill, Russell J.; Vossen, John L.; and Schulz, Stephen C., 5,487,821, Cl. 204-192.120.

Schumacher, Robert W.: *See*—
Nieh, Simon K.; Matossian, Jesse N.; Krajenbrink, Frans G.; and Schumacher, Robert W., 5,487,922, Cl. 427-528.000.

Schumann, Herbert: *See*—
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Schunk Kohlenstofftechnik GmbH: *See*—
Swoboda, Anton; Kubler, Edmund; Ulm, Horst; and Schardt, Gunter, 5,488,261, Cl. 310-249.000.

Schwab, Barry H.: *See*—
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Schwendemann, Volker: *See*—
Boeckh, Dieter; Funhof, Angelika; Kroner, Matthias; Hartmann, Heinrich; Baur, Richard; Kud, Alexander; and Schwendemann, Volker, 5,488,095, Cl. 528-361.000.

Schwenk, David M.: *See*—
Guativa, Alfonso C.; Schwenk, David M.; and Miller, James P., 5,487,311, Cl. 73-861.770.

Schwenk, Hans-Martin: *See*—
Mazura, Paul; and Schwenk, Hans-Martin, 5,488,543, Cl. 361-829.000.

Schwenn, Shannon R., to Orthomerica Products, Inc. Orthopaedic shoulder brace having adjustable pelvic and arm supports. 5,487,724, Cl. 602-20.000.

Scientific Products Corporation: *See*—
Gibboney, James W., Jr., 5,487,874, Cl. 422-186.030.

Scinicariello, Franco: *See*—
Eberle, Richard; Black, Darla; Scinicariello, Franco; and Hilliard, Julia, 5,487,969, Cl. 435-5.000.

Sciulli, Eugene B. Apparatus for drawing fluids into a hypodermic syringe. 5,487,738, Cl. 604-414.000.

Scott, Curtis E.; Kaliszewski, Mary Sue; and Levinson, Lionel M., to General Electric Company. Conversion of doped polycrystalline material to single crystal. 5,487,353, Cl. 117-4.000.

Seagate Technology, Inc.: *See*—
Leuthold, Hans; Jennings, David J.; Clark, Wesley R.; Khan, Raquib; and Heine, Guenther, 5,487,608, Cl. 384-113.000.

Sealright Company, Inc.: *See*—
Smith, Ernest L.; and Pantelleria, Joseph A., 5,487,491, Cl. 222-95.000.

Seaver, Jay R.; Diel, Mark A.; and Titcomb, Forrest, to Maxtor Corporation. Ultra-slim disk storage unit having a hydrodynamic bearing assembly which forms a stable meniscus. 5,488,523, Cl. 360-99.120.

Sebastian, Peter R.: *See*—
Lavorgna, Blaise; and Sebastian, Peter R., 5,487,710, Cl. 482-55.000.

Sechi, Giovanni M.: *See*—
Messina, Giuseppe; Sechi, Giovanni M.; and De Micheli, Silvio, 5,488,158, Cl. 564-125.000.

Sedberry, Donald C., to Max Levy Autograph, Inc. Print head and method of making same. 5,488,394, Cl. 346-141.000.

Sedgwick, Thomas O.: *See*—
Agnello, Paul D.; and Sedgwick, Thomas O., 5,487,783, Cl. 118-715.000.

Seemann, Henry R. Robotic apparatus. 5,487,440, Cl. 180-164.000.

Seewald, Gerhard. Multiple electrical outlet box with locking cover and power interrupt switch. 5,488,208, Cl. 200-43.220.

Seewaldt, Kurt, to ITW Oberflachentechnik GmbH. Electrostatic spray coating device for electrically conductive, non-combustible coating fluid. 5,487,782, Cl. 118-621.000.

Segieth, Franz: *See*—
von Ammon, Wilfried; Dornberger, Erich; Oelkrug, Hans; Gerlach, Peter; and Segieth, Franz, 5,487,354, Cl. 117-13.000.

Seidler, David: *See*—
Weiss, Stephan; and Seidler, David, 5,487,489, Cl. 222-1.000.

Seifert, Holger: *See*—
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Kobayashi, Michio; Hirayama, Hiroshi; and Nebashi, Satoshi, 5,488,591, Cl. 369-13.000.
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Norton, Paul F.; and Shaffer, James E., 5,487,642, Cl. 415-209.200.
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Shane, Tommy J., to Tomco$_2$ Equipment Co. Pressurized solution feed system for pH control. 5,487,835, Cl. 210-74.900.
Shank, James D., to Church & Dwight Co., Inc. Blast nozzle combined with multiple tip water atomizer. 5,487,695, Cl. 451-102.000.
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Shap, Inc.: *See*—
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Sharf, Lucille M.; Lynd, Laurence J.; Smith, James F.; and Schlueter, Edward L., Jr., to Xerox Corporation. Puzzle cut seamed belt with bonding between adjacent surfaces by UV cured adhesive. 5,487,707, Cl. 474-253.000.
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Sharma, Sudhir: *See*—
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Fried, Herbert E., 5,488,154, Cl. 562-540.000.
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Sheppard, Sherman H., to Surry Chemicals, Inc. Prescour bleaching tunnel. 5,487,283, Cl. 68-27.000.
Sher, Philip M., to Bristol-Myers Squibb Company. Benzo 1,3 dioxole derivatives. 5,488,064, Cl. 514-465.000.
Sherman, Gerald F., Jr.: *See*—
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Sherman, Victoria. Doll-shaped receptacle for plastic bags. 5,487,467, Cl. 206-216.000.
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Shibatani, Takeji; Komatsubara, Saburo; Omori, Kenji; and Akatsuka, Hiroyuki, to Tanabe Seiyaku Co., Ltd. Gene coding for esterase and novel microorganism containing said gene. 5,487,996, Cl. 435-252.100.
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Shier, John S., to VTC Inc. Programmable pre-amplifier using a serial shift register to output a plurality of control signals. 5,488,518, Cl. 360-67.000.
Shigetaka, Hiroshi; and Orita, Yasuhide, to Alps Electric Co., Ltd. Push button switch. 5,488,210, Cl. 200-344.000.
Shigetoh, Nobuyuki; Miyazaki, Jipsei; Nakayama, Hiroshi; Yugawa, Keiko; and Mitsumata, Tadayasu, to Matsushita Electric Industrial Co., Ltd. Labelling color, method of preparing the same and method for detecting methamphetamine with the color. 5,488,114, Cl. 548-510.000.
Shikata, Hiroyuki: *See*—
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Shima, Tomoaki, to NEC Corporation. Integrated logic circuit. 5,488,614, Cl. 371-22.300.
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Shimada, Tomoyuki; Sasaki, Masaomi; and Aruga, Tamotsu, to Ricoh Company, Ltd. Electrophotographic photoconductors and tertiary amine compounds having condensed polycyclic group for use in the same. 5,488,164, Cl. 564-426.000.
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Shimizu, Hiromasa, to Ricoh Company, Ltd. Image processing system. 5,488,486, Cl. 358-451.000.

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Shimizu, Masahiro; Shirahata, Masayoshi; Kuroi, Takashi; and Yamaguchi, Takehisa, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device capable of electrically erasing and writing information. 5,488,245, Cl. 257-316.000.

Shimizu, Nobukazu, to Kabushiki Kaisha Toshiba. Facsimile machine having received-image display function. 5,488,488, Cl. 358-468.000.

Shimizu, Osamu: *See*—
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Shin-Etsu Handotai Co., Ltd.: *See*—
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Shin, Hyunsoo: *See*—
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Shindo, Yoichi: *See*—
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Shiotani, Masaichi: *See*—
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Shirahata, Masayoshi: *See*—
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Shiraishi, Sumako; Masuda, Masami; and Nogami, Kazutaka, to Kabushiki Kaisha Toshiba. Data output circuit for semiconductor integrated circuit device which prevents current flow from the output to supply voltage. 5,488,326, Cl. 327-408.000.

Shirota, Shozo, to Mitsubishi Denki Kabushiki Kaisha. One-chip microcomputer manufacturing method. 5,488,006, Cl. 437-43.000.

Shirota, Yasuhiro; Inada, Hiroshi; Yonemoto, Yoshinobu; Wakimoto, Takeo; and Imai, Kunio, to Pioneer Electronic Corporation; and Bando Chemical Industries, Ltd. Organic electroluminescent device. 5,487,953, Cl. 428-690.000.

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Shpiro, Zeev; Groner, Gabriel F.; and Ordentlich, Erik, to DSP Solutions (International). Computerized system for teaching speech. 5,487,671, Cl. 434-185.000.

Shuchatowitz, Robert: *See*—
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Shultz, Gil F., to SGS-Thomson Microelectronics, Inc. Fuel flow stabilizer. 5,487,652, Cl. 417-543.000.

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Shuman, Robert T.: *See*—
Sall, Daniel J.; and Shuman, Robert T., 5,488,037, Cl. 514-19.000.

Shutt, John R.; and Touzard, Benoit M. F., to Exxon Chemical Patents Inc. Compositions for construction materials. 5,488,078, Cl. 524-71.000.

Shuttleworth, Leslie; Weber, Helmut; and Saeva, Franklin D., to Eastman Kodak Company. Thermal dye transfer system with receiver containing an acid-generating compound. 5,488,026, Cl. 503-227.000.

Siahpolo, Hassan: *See*—
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Sicinski, Rafal R.: *See*—
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Sieck, Peter A.; Hill, Russell J.; Vossen, John L.; and Schulz, Stephen C., to BOC Group, Inc., The. Anode structure for magnetron sputtering systems. 5,487,821, Cl. 204-192.120.

Siemens Aktiengesellschaft: *See*—
Fleck, Friedrich; and Jörgens, Klaus-Dieter, 5,488,404, Cl. 347-238.000.

Siemens Automotive S.A.: *See*—
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Siemens-Elema AB: *See*—
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Baitz, Günter; and Ihlenburg, Rainer, 5,488,202, Cl. 177-25.150.

Siemon Company, The: *See*—
Carlson, Robert C., Jr., 5,487,683, Cl. 439-718.000.

Sievert, Allen C.; and Nappa, Mario J., to Du Pont de Nemours, E. I., and Company. Process for fluorinated propanes and pentanes. 5,488,189, Cl. 570-172.000.

Siggins, Paul W.: *See*—
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Silagy, Howard. Buckle faceplate belt clamp. 5,487,210, Cl. 24-170.000.

Siltech Inc.: *See*—
O'Lenick, Anthony J., Jr., 5,488,121, Cl. 554-167.000.

Silva, Dennis: *See*—
Danielson, Arvin D.; Schultz, Darald R.; Silva, Dennis; Boatwright, Darrell L.; Austin, Rickey G.; and Alt, Daniel E., 5,488,575, Cl. 364-707.000.

Silvis, Paul H.; and Rightnour, Bradley R., to Restek Corporation. Connector for three or more capillary tubes. 5,487,569, Cl. 285-24.000.

Sim, Johnny O., to McGean-Rohco, Inc. Paint stripper. 5,487,789, Cl. 134-38.000.

Simendinger, Denise T.: *See*—
Glass, Jeffrey T.; Simendinger, Denise T.; and Goeller, Peter T., 5,488,232, Cl. 257-77.000.

Simeth, Claus, to MAN Roland Druckmaschinen AG. Suspension for a device serving as a guard in front of the printing-unit cylinders of a printing machine. 5,487,336, Cl. 101-216.000.

Simmel, Thomas L.; McDarren, Robert S.; and Truchsess, Joseph, to Link Group International. Ornament/display member. 5,487,925, Cl. 428-19.000.

Simmonds Precision Engine Systems, Inc.: *See*—
Bonavia, Howard V.; and Geislinger, Dale F., 5,488,536, Cl. 361-253.000.

Simmons, James A.: *See*—
Tekavec, James E.; and Simmons, James A., 5,487,717, Cl. 493-352.000.

Simon Fraser University: *See*—
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Simpson, William H.: *See*—

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Sims, John E.: *See*—
Dower, Steven K.; March, Carl J.; Sims, John E.; and Urdal, David L., 5,488,032, Cl. 514-2.000.

Singh, Akhileshwar R., to Federalloy, Inc. Copper-bismuth casting alloys. 5,487,867, Cl. 420-471.000.

Singh, Baldev; Bacon, Edward R.; and Robinson, Shaughnessy, to Eastman Kodak Company. Iodinated aroyloxy ketones. 5,488,133, Cl. 424-9.450.

Singhal, Dave M.; and Li, Sidong, to Trident MicroSystems, Inc. Multiple concurrent display system. 5,488,385, Cl. 345-3.000.

Sinha, Deepen: *See*—
Johnston, James D.; and Sinha, Deepen, 5,488,665, Cl. 381-2.000.

Sinha, Rabindra K., to Calgon Corporation. Method of minimizing deposits when firing tire derived fuels. 5,487,762, Cl. 44-363.000.

Sinko, John, to Wayne Pigment Corp. Corrosion inhibiting pigment composition and method. 5,487,779, Cl. 106-480.000.

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Chace, Raymond A., Jr.; and Manning, Mark C., 5,487,350, Cl. 114-330.000.

Skidmore, Wendy C., to Unisys Corporation. Computer program analyzer for adapting computer programs to different architectures. 5,488,714, Cl. 395-500.000.

Skis Rossignol S.A.: *See*—
Marmonier, Gilles, 5,487,227, Cl. 36-117.000.

Skoglund, Paul K. Flow control valve having flow adjustable by variable ring. 5,487,405, Cl. 137-501.000.

Slater, Walter C.: *See*—
Merle, Thomas C.; Ryan, Dale W.; Slater, Walter C.; Rowden, David L.; Sherman, Gerald F., Jr.; and Ianni, Alfonso, 5,488,448, Cl. 354-313.000.

Slawson, Michael R.; and Stiscia, James J., to Alcatel Network Systems, Inc. Laser bias and modulation circuit. 5,488,621, Cl. 372-31.000.

Sloan-Kettering Institute for Cancer Research: *See*—
Danishefsky, Samuel J.; Bornmann, William G.; Queneau, Yves; Magee, Thomas V.; Krol, Walter J.; Masters, John J.; and Jung, David K., 5,488,116, Cl. 549-214.000.

Slongo, Mario: *See*—
Leppard, David G.; Burdeska, Kurt; and Slongo, Mario, 5,488,108, Cl. 544-216.000.

Sluss, James J., Jr.: *See*—
Fagan, John E.; Sluss, James J., Jr.; Hassell, John W.; Mears, R. Brian; Beason, Ronnie B.; Wilkinson, Sonja R.; Lear, Tommy; and Tan, Kok S., 5,488,224, Cl. 250-227.160.

Slutsman, Lev: *See*—
Kaplan, Marc P.; Lu, Hui-Lan; and Slutsman, Lev, 5,488,569, Cl. 364-514.00R.

Smith, Allan F., to Precision Shooting Equipment, Inc. Archery bow with laterally adjustable limb pocket. 5,487,373, Cl. 124-23.100.

Smith, Daniel J.: *See*—
Eckert, Richard L.; Smith, Daniel J.; and Schafer, Irwin, 5,487,889, Cl. 424-93.100.

Smith, Danny E.: *See*—
Jenkins, Richard D.; Bassett, David R.; Smith, Danny E.; Argyropoulos, John N.; Loftus, James E.; and Shay, Gregory D., 5,488,180, Cl. 568-609.000.

Smith, David M.: *See*—
Witkowski, Joseph T.; Smith, David M.; and Wajer, Mark T., 5,487,879, Cl. 423-155.000.

Smith, Ernest L.; and Pantelleria, Joseph A., to Sealright Company, Inc. Cartridge dispenser with interior bag and interlocking lid. 5,487,491, Cl. 222-95.000.

Smith, George L., Jr.: *See*—
Diekhoff, Hans H.; and Smith, George L., Jr., 5,487,295, Cl. 72-379.400.

Smith, Harold C. Removable hanger. 5,487,517, Cl. 248-215.000.

Smith, James F.: *See*—
Sharf, Lucille M.; Lynd, Laurence J.; Smith, James F.; and Schlueter, Edward L., Jr., 5,487,707, Cl. 474-253.000.

Smith, James R. Surgical needle holder. 5,487,749, Cl. 606-205.000.

Smith, John A.; Lee, Fang-Jen S.; and Lin, Lee-Wen, to General Hospital Corporation, The. Glucose-regulated promoter of yeast acetyl-CoA hydrolase. 5,487,990, Cl. 435-172.300.

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Herrnstadt, Corinna; Fernandez, Joseph M.; Smith, Lloyd; and Mead, David A., 5,487,993, Cl. 435-172.300.

Smith, Nicholas J. G.: *See*—
Ludden, Michael J.; Penneck, Richard J.; and Smith, Nicholas J. G., 5,487,852, Cl. 264-400.000.

Smith, Ronald A.: *See*—
Hlousek, Louis; Odencrantz, K. C.; Oswald, Richard K.; Dahlin, Donald W.; Motaei, Saied; Siggins, Paul W.; Wong, Kenny; Smith, Ronald A.; and Scheinert, Philip M., 5,488,240, Cl. 250-231.160.

Smith, Stephen D.: *See*—
Bisbee, Philip I.; Richerson, James D.; Smith, Stephen D.; and Richardson, Eric S., 5,488,344, Cl. 336-206.000.

Smith, Steven R.; Cutler, Christopher A.; and Wallace, William D., to Clinical Innovation Associates, Inc. Uterine manipulator and manipulator tip assembly. 5,487,377, Cl. 600-204.000.

Smith, Todd L.: *See*—
Guzik, Andrzej T.; Smith, Todd L.; and Marchuk, Jeffrey P., 5,487,674, Cl. 439-83.000.

Smitherman, John P.: *See*—
McDonald, Daniel P.; and Smitherman, John P., 5,487,507, Cl. 239-391.000.

Snell, Jeffery D.; Schloss, Harold C.; Mann, Brian M.; Poore, John W.; and Medlin, Roy B., to Pacesetter, Inc. Method and apparatus for reporting and displaying a sequential series of pacing events. 5,487,754, Cl. 607-27.000.

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Snider, Michael T.; High, Kane M.; Panol, Georg; Ultman, James; Richard, Russell B.; Stene, John K.; and Russell, Garfield B., to Penn State Research Foundation, The. Method of implanting an intravascular membrane lung. 5,487,727, Cl. 604-49.000.

Sobczynski, Radoslaw: *See*—
Fateley, William G.; and Sobczynski, Radoslaw, 5,488,474, Cl. 356-326.000.

Sobel, Martin: *See*—
Demarest, David; Duncan, Robert B.; Sobel, Martin; Lenihan, Timothy P.; Rattan, William; Blanch, John F.; Hodulik, Michael G.; and Yost, Dennis P., 5,487,212, Cl. 29-407.000.

Sobotta, Rainer, to Boehringer Ingelheim KG. Process for the racemization of nonracemic 3-oxyocylopentane- or -hexanecarboxylic acids or their esters with C_1-C_6-alcohols. 5,488,136, Cl. 560-122.000.

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Anderson, Peter L.; Cowell, Michael J.; and Hotek, Dan J., 5,487,623, Cl. 405-286.000.

Sodena: *See*—
Huignard, Jean; and Sauvin, Patrick, 5,488,630, Cl. 375-206.000.

Söderberg, Staffan. Bale, an apparatus and a method for the wrapping of a bale in two crossing wrapping layers applied in overlapping helical turns. 5,487,255, Cl. 53-399.000.

Soderlund, David M.; Knipple, Douglas C.; and Henderson, Joseph E., to Cornell Research Foundation, Inc. DNA encoding an insect gamma-aminobutyric acid (GABA) receptor subunit cells expressing it, and pesticide screening methods using such cells. 5,487,976, Cl. 435-7.210.

Sofamore Danek Group: *See*—
Cotrel, Yves P., 5,487,742, Cl. 606-61.000.

Sofamore, S.N.C.: *See*—
Laurain, Jean-Marie; DeWald, Ronald L.; D'Amore, Jean-François; and Deneuvillers, Guy, 5,487,743, Cl. 606-61.000.

Sokol, John C.: *See*—
Falgén, Helena; Sundström, Göran; Landfors, Johan; and Sokol, John C., 5,487,881, Cl. 423-478.000.

Solar Turbines Incorporated: *See*—
Norton, Paul F.; and Shaffer, James E., 5,487,642, Cl. 415-209.200.

Solid State Farms, Inc.: *See*—
McKinney, David K.; Fuller, Milton E.; and Carone, Berry V., 5,487,870, Cl. 422-73.000.

Somerville, Lorne R.: *See*—
Walkingshaw, M. Jay; Somerville, Lorne R.; Esdaile, Anthony R.; and Stuart, David J., 5,488,423, Cl. 348-460.000.

Sommer Company: *See*—
Sommer, Gordon M., 5,487,456, Cl. 192-18.00A.

Sommer, Gordon M., to Sommer Company. Press drive with oil shear clutch/brake drives with internal flywheel brake. 5,487,456, Cl. 192-18.00A.

Sommer, Gordon M., to Midwest Brake Bond Company. Electrically energized oil shear drive system. 5,487,458, Cl. 192-18.00B.

Sommer, Klaus: *See*—
Thurm, Siegfried; Sommer, Klaus; Bier, Peter; Elschner, Andreas; Kowitz, Manfred; and Sandquist, Axel, 5,487,810, Cl. 216-67.000.

Song, Seung Wan: *See*—
Oh, Young Jei; Choy, Jin-Ho; Jung, Hyung Jin; Han, Yang Su; and Song, Seung Wan, 5,487,878, Cl. 423-140.000.

Sonoco Products Company: *See*—
Drummond, Michael T.; Hill, Calvin G.; Lowman, Richard M., Jr.; Suski, William C.; Roberts, Rodney W.; and Lowry, James W., 5,487,506, Cl. 229-202.000.

Sony Corporation: *See*—
Ishida, Takehisa; and Takino, Hiroshi, 5,488,519, Cl. 360-77.030.
Ishimatsu, Yoshikazu, 5,488,605, Cl. 369-291.000.
Kitamura, Takuya, 5,488,367, Cl. 341-106.000.
Kondo, Tetsujiro; and Nakaya, Hideo, 5,488,618, Cl. 371-67.100.
Okada, Hiroshi; and Shima, Hisato, 5,488,481, Cl. 358-319.000.
Ota, Yutaka; Iguchi, Yukinobu; and Nakayama, Yoshifumi, 5,488,264, Cl. 313-412.000.
Sato, Makoto; Yamazaki, Hiroshi; Kotabe, Noriko; Osakabe, Yoshio; Kusagaya, Yasuo; Tanaka, Shigeo; Sugiyama, Kouich; and Katsuyama, Akira, 5,488,357, Cl. 340-825.250.
Sugawara, Minoru, 5,487,963, Cl. 430-5.000.
Takemura, Taketoshi; Sakuwa, Makoto; and Watanuki, Haruo, 5,488,263, Cl. 313-402.000.
Watanabe, Tetsu; and Yamagami, Tamotsu, 5,488,590, Cl. 369-13.000.
Zampini, Michael A.; Flum, Alan; Davis, Donald E.; and Dombrowski, Joseph J., 5,488,669, Cl. 381-119.000.

Sony Electronics Inc.: *See*—
Zampini, Michael A.; Flum, Alan; Davis, Donald E.; and Dombrowski, Joseph J., 5,488,669, Cl. 381-119.000.
Soraya, Sorayapour. Method of quenching metals. 5,487,796, Cl. 148-633.000.
Sorge, Joseph A.: *See*—
McClelland, Michael; Welsh, John T.; and Sorge, Joseph A., 5,487,985, Cl. 435-91.200.
Sorrentino, Gregory; and Alli, Alim, to United States Surgical Corporation. Surgical apparatus for applying surgical fasteners including a counter. 5,487,499, Cl. 227-175.100.
Sotoya, Kohshiro; Abe, Hiroshi; Aikawa, Jun; Taniguchi, Hideki; and Nishimoto, Uichiro, to Kao Corporation. Tertiary amino alcohol and method of producing the same. 5,488,168, Cl. 564-506.000.
Southwest Foundation for Biomedical Research: *See*—
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Southwestern Bell Technology Resources, Inc.: *See*—
Harbin, Steven A.; and Rainer, Brian K., 5,488,737, Cl. 455-33.100.
Sovak, Milos; Terry, Ronald C.; Douglass, James G., III; and Bakir, Farid, to Biophysica, Inc. Sunblocking polymers and their formulation. 5,487,885, Cl. 424-59.000.
Span America Medical Systems, Inc.: *See*—
Wilkinson, John W.; and Raburn, Richard W., 5,487,196, Cl. 5-453.000.
Sparrey, Julian M.: *See*—
Kettlewell, Peter J.; Paice, Mark E. R.; Whetlor, William C.; and Sparrey, Julian M., 5,487,698, Cl. 452-58.000.
Specialized Health Products, Inc.: *See*—
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Spectus Limited: *See*—
Tindall, David; and Sarjeant, Malcolm, 5,488,355, Cl. 340-578.000.
Speliotis, Dennis E.: *See*—
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Spencer, Lee; Kolthammer, Brian W. S.; Ripplinger, Miriam P.; Wooster, Jeffrey J.; Chum, Pak-Wing S.; and deGroot, Jacquelyn A., to Dow Chemical Company, The. Silica supported transition metal catalyst. 5,487,938, Cl. 428-332.000.
Spinelli, Julio C.: *See*—
Salo, Rodney W.; Spinelli, Julio C.; and Tockman, Bruce A., 5,487,752, Cl. 607-17.000.
Springsteen, Arthur W.; and Taylor, Jeffrey L., to Labsphere, Inc. Method of and apparatus for increasing measurement sensitivity of fluorescence and luminescence. 5,488,473, Cl. 356-317.000.
Sresty, Guggliam C.: *See*—
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Sridhar, Thirumalai, to Texas Instruments Incorporated. Scan test circuits for use with multiple frequency circuits. 5,488,613, Cl. 371-22.300.
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Stafford, Robert M. Method and apparatus for uniformly tensioning fabric panels of portable buildings. 5,487,242, Cl. 52-86.000.
Stagmann, Robert; and Demmerle, Rudolf, to Grieshaber & Co. AG Schaffhausen. Opthalmic surgical apparatus for macerating and removing the lens nucleus from the eye of a living being. 5,487,747, Cl. 606-166.000.
Staniek, Peter, to Sandoz Ltd. Polyolefin stabilization. 5,488,079, Cl. 524-116.000.
Staniszewski, Tadeusz, to Shap, Inc. Folder for sheet paper such as letter-mail, fliers and the like. 5,487,718, Cl. 493-421.000.
Star, Albert A.; and Carbone, Anthony T., to Northrop Grumman Corporation. Pin BNC coaxial cable connector receptacle. 5,487,681, Cl. 439-581.000.
Star Technologies, Inc.: *See*—
Rich, Henry H., 5,488,687, Cl. 395-164.000.
Starkey, Daniel C.: *See*—
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Steelcase Inc.: *See*—
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Knoblock, Glenn A., 5,487,591, Cl. 297-452.140.
Stegmann, George: *See*—
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Stein, Judith, to General Electric Company. Bis(bis-silylalkyl) dicarboxylates as adhesion promoters and compositions containing them. 5,487,948, Cl. 428-447.000.
Steinberg, Deborah: *See*—
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Steinmann, Bettina; Schulthess, Adrian; and Hunziker, Max, to Ciba-Geigy Corporation. Photosensitive compositions. 5,487,966, Cl. 430-269.000.
Stene, John K.: *See*—
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Sterling Winthrop Inc.: *See*—
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Stillbäck, Ola; and Lindahl, Lars, to AB Volvo. Electrical contract nut. 5,487,685, Cl. 439-801.000.
Stiscia, James J.: *See*—
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Stockton, John: *See*—
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Stoehr, Roland R.: *See*—
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Stoffle, Linda M.: *See*—
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Stoffle, Thomas N.; and Stoffle, Linda M. Clamps for making corrugated panel free standing play structures. 5,487,690, Cl. 446-105.000.
Stoll, Kurt; de Fries, Jan R.; and Köngeter, Herbert, to Festo KG. Spool valve. 5,487,409, Cl. 137-625.640.
Stoll, Steven: *See*—
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Stolp, Philip E., to Point Plastics Incorporated. Pipette tip mounting and transfer apparatus and method. 5,487,997, Cl. 436-54.000.
Strange, Kevin: *See*—
Kallesoe, Klaus; Hoffer, Joaquín A.; Strange, Kevin; and Valenzuela, Ignacio, 5,487,756, Cl. 607-118.600.
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Stroppolo, Federico; Bonadeo, Daniele; Tocchini, Francesco; and Gazzaniga, Annibale, to Zambon Group S.p.A. Ophthalmic pharmaceutical composition containing N-acetyl-cysteine and polyvinylalcohol. 5,488,069, Cl. 514-772.400.
Stroscio, Michael A.: *See*—
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Strowe, Robert J., to Gait Scan, Inc. Apparatus for supporting an arm. 5,487,395, Cl. 128-878.000.
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Subramanyam, Chakrapani: *See*—
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Sudo, Sumio: *See*—
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Sugawara, Minoru, to Sony Corporation. Phase shifting mask wherein light transmitted through second transmission areas intensifies light through first transmission areas. 5,487,963, Cl. 430-5.000.

Sugawara, Ryoichi: *See—*
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Sugimoto, Hitoshi: *See—*
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Sugiura, Hiroaki: *See—*
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Sugiyama, Akio: *See—*
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Sugiyama, Kouich: *See—*
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Sulek, Stanislaw; and Hussein, Hany M. G., to Energy Life Systems Corporation. Laser device for ablation of human tissue. 5,487,740, Cl. 606-15.000.

Sumigawa, Yukio, to Sanshin Kogyo Kabushika Kaisha. Outboard motor. 5,487,688, Cl. 440-88.000.

Sumikawa, Michito; Koguchi, Yoshihito; Ohgane, Takao; Irie, Yasuo; and Takahashi, Satoji, to Ajinomoto Co., Inc. Crystals of N-(trans-4-isopropylcyclohexycarbonyl)-D-phenylalanine and methods for preparing them. 5,488,150, Cl. 562-450.000.

Sumitomo Chemical Company, Limited: *See—*
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Nitta, Itaru; and Asai, Kuniaki, 5,488,138, Cl. 560-144.000.
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Sumitomo Chemical Co., Ltd.: *See—*
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Sumitomo Electric Industries, Inc.: *See—*
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Sumitomo Electric Industries, Ltd.: *See—*
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Sun, Jung-Hui, to Du Pont Merck Pharmaceutical Company, The. Highly water soluble bis-naphthalimides useful as anticancer agents. 5,488,110, Cl. 546-100.000.

Sun Microsystems, Inc.: *See—*
Testa, James F.; Horstmann, Jens; and Siahpolo, Hassan, 5,488,539, Cl. 361-720.000.

Sunder, Shyam: *See—*
Flynn, Gary A.; Cregge, Robert J.; Fevig, Thomas L.; Sunder, Shyam; and Shum, Patrick W., 5,488,048, Cl. 514-214.000.

Sundstrand Corporation: *See—*
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Baker, Michael J.; Dilworth, Jonathan R.; Sunley, John G.; and Wheatley, Nigel, 5,488,153, Cl. 562-519.000.

Sunouchi, Kazumasa; Takato, Hiroshi; Ozaki, Tohru; Okabe, Naoko; Hieda, Katsuhiko; Horiguchi, Fumio; Nitayama, Akihiro; Yamada, Takashi; Hasimoto, Kouji; and Inoue, Satosi, to Kabushiki Kaisha Toshiba. Semiconductor memory device. 5,488,242, Cl. 257-301.000.

Supcoe, Robert F.; and Moran, Francis J., Jr., to United States of America, Navy. Water ablative coating for drag reduction applications. 5,488,076, Cl. 523-175.000.

Superconductor Technolgies Inc.: *See—*
Fenzi, Neal O.; and Long, Stephen I., 5,488,382, Cl. 343-700.00R.

Surry Chemicals, Inc.: *See—*
Sheppard, Sherman H., 5,487,283, Cl. 68-27.000.

Suski, William C.: *See—*
Drummond, Michael T.; Hill, Calvin G.; Lowman, Richard M., Jr.; Suski, William C.; Roberts, Rodney W.; and Lowry, James W., 5,487,506, Cl. 229-202.000.

Sutherland, William M.: *See—*
Taylor, Ronald P.; Sutherland, William M.; Reist, Craig; Wright, Eleanor L.; Webb, Donna; and Labuguen, Ronald, 5,487,890, Cl. 424-136.100.

Sutton, Ted L.: *See—*
Mason, Charles M.; and Sutton, Ted L., 5,487,836, Cl. 210-791.000.

Suykerbuyk, Jacoba C. L. J.: *See—*
Drent, Eit; Pello, Dennis H. L.; and Suykerbuyk, Jacoba C. L. J., 5,488,174, Cl. 568-454.000.

Suzuki, Akira: *See—*
Yabe, Hisao; Iida, Yoshihiro; Suzuki, Akira; Ito, Hideo; Tashiro, Yoshio; Yamazaki, Minoru; and Tamada, Osamu, 5,487,376, Cl. 600-121.000.

Suzuki, Isao; Shindo, Masuo; and Nakao, Kiyoshi, to Fuji Electric Co., Ltd. Apparatus for laminating plates. 5,487,808, Cl. 156-556.000.

Suzuki, Koichi: *See—*
Go, Shintetsu; Kashizaki, Yoshio; Suzuki, Koichi; Sato, Kazuma; and Shimada, Akira, 5,488,461, Cl. 355-211.000.

Suzuki, Nobumasa, to Canon Kabushiki Kaisha. Microwave introducing device provided with an endless circular waveguide and plasma treating apparatus provided with said device. 5,487,875, Cl. 422-186.050.

Suzuki, Norio: *See—*
Akashi, Tomoko; and Suzuki, Norio, 5,488,428, Cl. 348-578.000.

Suzuki, Ryuji, to Fanuc Ltd. Device for preventing cutting fluid from entering a bearing on a spindle in a machine tool. 5,487,628, Cl. 409-135.000.

Suzuki, Shogo: *See—*
Ohno, Takamasa; Kato, Keietsu; Yamaguchi, Yoshiyuki; Murakami, Masami; Suzuki, Shogo; Kanda, Shoichi; and Nakagawa, Tsuyoshi, 5,487,425, Cl. 166-295.000.

Suzuki, Yoshiyuki; and Funada, Masahiro, to Canon Kabushiki Kaisha. Color image processing method and apparatus. 5,488,670, Cl. 382-165.000.

Svahn, Ingemar: *See—*
Askman, Lars; Leonhardt, Werner; and Svahn, Ingemar, 5,487,905, Cl. 426-297.000.

Swanbom, Deryl D.: *See—*
Polson, Alan M.; Swanbom, Deryl D.; Dunn, Richard L.; Cox, Charles P.; Norton, Richard L.; Lowe, Bryan K.; and Peterson, Kenneth S., 5,487,897, Cl. 424-426.000.

Swartz, James R., to Genentech, Inc. Method of determining propensity of dissolved oxygen instability. 5,487,980, Cl. 435-29.000.

Sweeney, Eugene J.; and Pelts, Gregory A., to Lord Corporation. Method for obtaining mechanical lock between surfaces. 5,487,803, Cl. 156-91.000.

Sweet, Christopher R., to Geotechnical Instruments (UK) Limited. Gas analyzer. 5,488,227, Cl. 250-343.000.

Swoboda, Anton; Kubler, Edmund; Ulm, Horst; and Schardt, Gunter, to Schunk Kohlenstofftechnik GmbH. Carbon brush and fastening a braided indicator wire therein. 5,488,261, Cl. 310-249.000.

Symbios Logic Inc.: *See—*
Crafts, Harold S., 5,488,249, Cl. 257-401.000.

Synaptics, Incorporated: *See—*
Mead, Carver A.; Wolf, Ralph; and Allen, Timothy P., 5,488,204, Cl. 178-18.000.

Syntec, Inc.: *See—*
Peyman, Gholam A., 5,487,725, Cl. 604-22.000.

Systematic Drill Head Co. Ltd.: *See—*
Child, Robin E., 5,487,631, Cl. 409-231.000.

Szweda, Andrew; Millard, Michael L.; and Harrison, Michael G., to General Electric Company. Fibert reinforced ceramic matrix composite member. 5,488,017, Cl. 501-95.000.

Ta, Chuong C.: *See—*
Nguyen, Michael A.; Stewart, Lowell J.; Kline, Daniel S.; Boeller, Robert A.; Ta, Chuong C.; and Haselby, Robert D., 5,488,397, Cl. 347-40.000.

Tabata, Tetsuro: *See—*
Itoh, Hiroki; Tabata, Tetsuro; and Kikuta, Jun-Ichi, 5,487,900, Cl. 424-451.000.

Tabuchi, Hisashi: *See—*
Tanaka, Yoshimasa; and Tabuchi, Hisashi, 5,488,219, Cl. 219-644.000.

Tachibana, Shunichi, to Canon Kabushiki Kaisha. Image recording apparatus. 5,488,407, Cl. 347-264.000.

Taddei, Mario A. High-tension current transformer, with storage production by means of the automatization of the insulation thereof. 5,488,343, Cl. 336-229.000.

Taflove, Allen: *See—*
Bridges, Jack E.; Sresty, Guggliam C.; and Taflove, Allen, 5,487,873, Cl. 588-212.000.

Tagamolila, Constante P.: *See—*
Schulz, Russell C.; Tagamolila, Constante P.; and Bullen, Patrick J., 5,487,816, Cl. 203-14.000.

Taguchi, Kohei; Ayada, Michihiko; and Shingu, Hideo, to NHK Spring Co., Ltd. Method for an article made of a Ti-Al intermetallic compound. 5,487,866, Cl. 419-28.000.

Taguchi Medical Co., Ltd.: *See—*
Maruyama, Yu; Taguchi, Yoshu; and Hayano, Kijuro, 5,487,741, Cl. 606-60.000.

Taguchi, Yoshu: *See—*
Maruyama, Yu; Taguchi, Yoshu; and Hayano, Kijuro, 5,487,741, Cl. 606-60.000.

Tahara, Hisatsugu: *See—*
Fukada, Taisei; Miyata, Masanori; Adachi, Hideki; Nakamura, Shinichi; Ohki, Naoyuki; Kaneko, Tokuharu; Kuroyanagi, Satoshi; Ozaki, Hiroshi; Tahara, Hisatsugu; Kaneko, Satoshi; and Takizawa, Mitsuharu, 5,488,454, Cl. 355-202.000.

Tai, Jimmy J.: *See—*
Olmstead, Thomas A.; Gonzalez, Michael A.; Orvik, Jon A.; Pearson, Douglas L.; Ringer, James W.; Shiang, Dawn; Tai, Jimmy J.; and Wallin, Anne P., 5,488,109, Cl. 544-263.000.

Taka, Shin-ichi: *See—*
Kimura, Koji; and Taka, Shin-ichi, 5,488,002, Cl. 437-31.000.

Takada, Kunio; Otani, Kenji; Yamada, Masayuki; Maru, Saburo; Sudo, Sumio; and Tanaka, Sadashi, to Hitachi, Ltd. Large-depth underground drainage facility and method of running same. 5,487,621, Cl. 405-52.000.

Takagi, Jiro: *See—*
Maruyama, Shigeru; Shimasaki, Yuichi; Kanehiro, Masaki; Hisaki, Takashi; Baba, Shigeki; Ishioka, Takuji; Takagi, Jiro; and Akiyama, Eitetsu, 5,487,676, Cl. 439-125.000.

Takahashi, Kenichi; Takeishi, Minako; and Onishi, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Signal processing circuit for spread spectrum communications. 5,488,629, Cl. 375-206.000.

Takahashi, Kiichiro: *See*—
Matsubara, Miyuki; Hirabayashi, Hiromitsu; Sugimoto, Hitoshi; and Takahashi, Kiichiro, 5,488,398, Cl. 347-43.000.

Takahashi, Kohji: *See*—
Hirasawa, Masahide; and Takahashi, Kohji, 5,488,414, Cl. 348-207.000.

Takahashi, Koichi; Kataoka, Hiroshi; Ichikawa, Haruo; Takatori, Tetsuya; and Naito, Toshiharu, to Fuji Photo Film Co., Ltd. Photographic film cassette machine with film anchoring device. 5,487,513, Cl. 242-348.100.

Takahashi, Masaharu: *See*—
Omura, Naoki; Igarashi, Minoru; Inoue, Yoshio; and Takahashi, Masaharu, 5,488,125, Cl. 556-463.000.

Takahashi, Satoji: *See*—
Sumikawa, Michito; Koguchi, Yoshihito; Ohgane, Takao; Irie, Yasuo; and Takahashi, Satoji, 5,488,150, Cl. 562-450.000.

Takahashi, Tadashi; Fujita, Takashi; Nakamura, Kazuo; and Tsukamoto, Seiichi, to Mitsubishi Chemical Corporation. Catalyst component for olefin polymerization. 5,488,022, Cl. 502-115.000.

Takahashi, Tadashi; Utsui, Tetsuya; Adachi, Rensuke; Iida, Mitsuru; Furuya, Katsuhiko; Usami, Junji; and Honda, Ryoji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Light source apparatus for endoscope. 5,488,509, Cl. 359-385.000.

Takahashi, Yoshitaka: *See*—
Akiyama, Hiroshi; and Takahashi, Yoshitaka, 5,488,599, Cl. 369-112.000.

Takahata, Haruo: *See*—
Asida, Shyoji; Takahata, Haruo; and Katsuki, Takayo, 5,488,348, Cl. 338-22.00R.

Takai, Yousuke: *See*—
Ikkanzaka, Isao; Ikeda, Kazuhiro; and Takai, Yousuke, 5,487,944, Cl. 428-374.000.

Takamura, Kozo, to Nippondenso Co., Ltd. Spark electrode having low thermal stress. 5,488,262, Cl. 313-141.000.

Takanashi, Hiroshi; Ogura, Masami; and Tanimoto, Masahiro, to Sharp Kabushiki Kaisha; and Sanyo Vacuum Industries Co, Ltd. Color liquid crystal device with organic smoothing layer over ITO separated by an oxide layer and a nitride layer. 5,488,497, Cl. 359-74.000.

Takasaki, Mamoru: *See*—
Ozeki, Masamichi; Takasaki, Mamoru; Miyamoto, Katsuyuki; and Tsuruda, Mitsumasa, 5,487,252, Cl. 53-212.000.

Takase, Akira; Kai, Hiroyuki; Nishida, Kuniyoshi; Shinomoto, Shoji; and Nagai, Masahiko, to Shionogi & Co., Ltd. Process for producing methoxyiminoacetamide compounds and intermediates. 5,488,159, Cl. 564-164.000.

Takata Corporation: *See*—
Hiramatsu, Koji, 5,487,563, Cl. 280-806.000.

Takato, Hiroshi: *See*—
Sunouchi, Kazumasa; Takato, Hiroshi; Ozaki, Tohru; Okabe, Naoko; Hieda, Katsuhiko; Horiguchi, Fumio; Nitayama, Akihiro; Yamada, Takashi; Hasimoto, Kouji; and Inoue, Satosi, 5,488,242, Cl. 257-301.000.

Takatori, Tetsuya: *See*—
Takahashi, Koichi; Kataoka, Hiroshi; Ichikawa, Haruo; Takatori, Tetsuya; and Naito, Toshiharu, 5,487,513, Cl. 242-348.100.

Takayama, Gen: *See*—
Kasahara, Shigeo; Sueoka, Kiyoshi; Takayama, Gen; Satoh, Shingo; and Houjyou, Hidemi, 5,487,417, Cl. 141-32.000.

Takayanagi, Yoshiaki; Saito, Asao; and Koizumi, Ryoichi, to Canon Kabushiki Kaisha. Liquid jet recording apparatus. 5,488,395, Cl. 347-7.000.

Takechi, Shozo: *See*—
Mori, Sachio; Takechi, Shozo; and Kida, Shiro, 5,488,134, Cl. 560-53.000.

Takeda Chemical Industries, Limited: *See*—
Itoh, Hiroki; Tabata, Tetsuro; and Kikuta, Jun-Ichi, 5,487,900, Cl. 424-451.000.

Takeda, Masashi; Fukuhara, Kazuyuki; and Murakami, Motoichi, to Toyota Jidosha Kabushiki Kaisha. Piston for an internal combustion engine. 5,487,364, Cl. 123-193.600.

Takeishi, Minako: *See*—
Takahashi, Kenichi; Takeishi, Minako; and Onishi, Hiroshi, 5,488,629, Cl. 375-206.000.

Takemoto, Takatoshi; Yoshikawa, Masayoshi; Aoyama, Moriyuki; Muramatsu, Meiji; and Kawashima, Kazunari, to Kabushiki Kaisha Ace Denken. Apparatus for polishing medals for game machine and for separating abrasive therefrom. 5,487,696, Cl. 451-105.000.

Takemura, Taketoshi; Sakuwa, Makoto; and Watanuki, Haruo, to Mitsubishi Denki Kabushiki Kaisha; and Sony Corporation. Color selecting electrode for cathode-ray tube. 5,488,263, Cl. 313-402.000.

Takemura, Yoshinari: *See*—
Furumiya, Shigeru; and Takemura, Yoshinari, 5,488,593, Cl. 369-32.000.

Takeno, Fumio: *See*—
Uno, Yoichiro; Takeno, Fumio; Yamatoya, Kazuhiko; and Ohtsu, Keiji, 5,488,105, Cl. 536-128.000.

Takeuchi, Hitoshi: *See*—
Yamada, Eiji; and Takeuchi, Hitoshi, 5,488,636, Cl. 375-340.000.

Takeuchi, Kiyoshi: *See*—
Kamioka, Hideki; Kobayashi, Kazumitsu; Shimamura, Masahiko; and Takeuchi, Kiyoshi, 5,488,311, Cl. 324-674.000.

Takeuchi, Takashi; Saitoh, Tadashi; Matsunaga, Toshihiro; Mori, Masashi; and Fujiya, Hajime, to Hitachi, Ltd.; and Hitachi Video Engineering, Inc. Optical information recording medium having a transitioning three bit access pit group and optical information recording/reproducing apparatus using the same. 5,488,595, Cl. 369-54.000.

Takeuchi, Tomio: *See*—
Kondo, Shinichi; Shibahara, Seiji; Usui, Takayuki; Kudo, Toshiaki; Gomi, Shuichi; Tamura, Atsushi; Ikeda, Yoko; Ikeda, Daishiro; and Takeuchi, Tomio, 5,488,038, Cl. 514-41.000.

Takigawa, Yoshiharu: *See*—
Kawakami, Yoshinaka; Takigawa, Yoshiharu; Isomura, Arihiro; Kamiya, Kouichi; and Hamatani, Katsunori, 5,488,353, Cl. 340-576.000.

Takino, Hiroshi: *See*—
Ishida, Takehisa; and Takino, Hiroshi, 5,488,519, Cl. 360-77.030.

Takishima, Yasuhiro; Wada, Masahiro; and Murakami, Hitomi, to Kokusai Denshin Denwa Co., Ltd. System for providing reversible variable length codes. 5,488,616, Cl. 371-30.000.

Takita, Hidenori; and Hirakawa, Tatsuhiro, to Mitsubishi Denki Kabushiki Kaisha. Color CRT display apparatus. 5,488,270, Cl. 315-370.000.

Takizawa, Mitsuharu: *See*—
Fukada, Taisei; Miyata, Masanori; Adachi, Hideki; Nakamura, Shinichi; Ohki, Naoyuki; Kaneko, Tokuharu; Kuroyanagi, Satoshi; Ozaki, Hiroshi; Tahara, Hisatsugu; Kaneko, Satoshi; and Takizawa, Mitsuharu, 5,488,454, Cl. 355-202.000.

Talley, John J., to Monsanto Company. Process for making optically active alpha-amino ketones and selected novel optically active alpha-amino ketones. 5,488,132, Cl. 560-39.000.

Tamada, Osamu: *See*—
Yabe, Hisao; Iida, Yoshihiro; Suzuki, Akira; Ito, Hideo; Tashiro, Yoshio; Yamazaki, Minoru; and Tamada, Osamu, 5,487,376, Cl. 600-121.000.

Tamaki, Takeo: *See*—
Ohmi, Tadahiro; Yonekawa, Naomichi; Horiki, Hiroyuki; Kaji, Toshimitsu; Kunimoto, Fumitomo; and Tamaki, Takeo, 5,487,398, Cl. 134-95.100.

Tamamura, Manpei; Iidaka, Hiroshi; and Shibata, Eiji, to Fuji Jukogyo Kabushiki Kaisha. Vehicle internal noise reduction system. 5,488,667, Cl. 387-71.000.

Tamarack Storage Devices: *See*—
Redfield, Stephen R.; Willenbring, Gerald R.; Stockton, John; and Halter, Edward A., 5,488,494, Cl. 359-22.000.

Tamura, Atsushi: *See*—
Kondo, Shinichi; Shibahara, Seiji; Usui, Takayuki; Kudo, Toshiaki; Gomi, Shuichi; Tamura, Atsushi; Ikeda, Yoko; Ikeda, Daishiro; and Takeuchi, Tomio, 5,488,038, Cl. 514-41.000.

Tamura, Hideki: *See*—
Sakamoto, Hiroshi; Tamura, Hideki; and Furukawa, Kaoru, 5,488,552, Cl. 363-21.000.

Tamura, Hiroshi; Fukagai, Toshio; Mishima, Naoshi; and Sasaki, Masaomi, to Ricoh Company, Ltd. Acrylic acid ester derivative having a triphenyl amine skeleton. 5,488,137, Cl. 560-141.000.

Tan, Kok S.: *See*—
Fagan, John E.; Sluss, James J., Jr.; Hassell, John W.; Mears, R. Brian; Beason, Ronnie B.; Wilkinson, Sonja R.; Lear, Tommy; and Tan, Kok S., 5,488,224, Cl. 250-227.160.

Tan, Yulan: *See*—
Havens, Timothy J.; Tan, Yulan; and Scaturro, John, Jr., 5,488,339, Cl. 335-216.000.

Tanabe, Noboru; Oyanagi, Shigeru; Baba, Shinichi; Kaminishi, Katsuji; Nakamura, Masaru; and Sekido, Kazunori, to Kabushiki Kaisha Toshiba. Optical interconnection suitable for highly parallel computer system. 5,488,735, Cl. 395-800.000.

Tanabe Seiyaku Co., Ltd.: *See*—
Shibatani, Takeji; Komatsubara, Saburo; Omori, Kenji; and Akatsuka, Hiroyuki, 5,487,996, Cl. 435-252.100.

Tanaka, Hirokazu; and Tsuchiya, Keiji, to Canon Kabushiki Kaisha. Recording and reproducing method in which data and updating data are recorded in a sector of a selected block of a recording medium in a predetermined order without recording a directory. 5,488,718, Cl. 395-600.000.

Tanaka, Hiroshi: *See*—
Nakanishi, Kaoru; Horino, Shinji; Shiono, Kiyoshi; Tanaka, Hiroshi; and Terada, Kunihiro, 5,488,389, Cl. 345-131.000.

Tanaka, Hitoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom lens barrel. 5,488,513, Cl. 359-699.000.

Tanaka, Mitsutoshi, to Fuji Photo Film Co., Ltd. Nonaqueous secondary battery. 5,487,960, Cl. 429-218.000.

Tanaka, Saburo; Matsuura, Takashi; and Itozaki, Hideo, to Sumitomo Electric Industries, Inc. Superconductor junction structure including two oxide superconductor layers separated by a non-superconducting layer. 5,488,030, Cl. 505-190.000.

Tanaka, Sadashi: *See*—
Takada, Kunio; Otani, Kenji; Yamada, Masayuki; Maru, Saburo; Sudo, Sumio; and Tanaka, Sadashi, 5,487,621, Cl. 405-52.000.

Tanaka, Shigeo: *See*—
Sato, Makoto; Yamazaki, Hiroshi; Kotabe, Noriko; Osakabe, Yoshio; Kusagaya, Yasuo; Tanaka, Shigeo; Sugiyama, Kouich; and Katsuyama, Akira, 5,488,357, Cl. 340-825.250.

Tanaka, Shinji: *See*—

Sato, Kazuo; Shikida, Mitsuhiro; Ohuchi, Shigeo; Hatada, Toshio; Ashiwake, Noriyuki; Tanaka, Shinji; Harada, Takeshi; and Honda, Yukio, 5,488,255, Cl. 257-718.000.

Tanaka, Takaaki; and Sato, Yuzuru, to Seiko Epson Corporation. Liquid crystal display device utilizing a chiral nematic liquid crystal medium operative relative to two metastable states. 5,488,499, Cl. 359-102.000.

Tanaka, Yoshimasa; and Tabuchi, Hisashi, to Neturen Co., Ltd. Induction heating coil assembly and method for hardening inner surface of cylinder by using the same. 5,488,219, Cl. 219-644.000.

Tanaka, Yutaka: *See*—
Ibaraku, Motohiro; and Tanaka, Yutaka, 5,488,238, Cl. 257-207.000.

Tandem Computers Incorporated: *See*—
Aldridge, David L.; Bissell, Stephen R.; and Gunn, Daniel D., 5,488,531, Cl. 361-18.000.

Taneya, Motoaka; Kawanishi, Hidenori; Morioka, Tatsuya; and Shimonaka, Atsushi, to Sharp Kabushiki Kaisha. Assembly structure for an optical integrated circuit device. 5,488,678, Cl. 385-14.000.

Tanibata, Toru, to Noritsu Koki, Co. Image printer. 5,488,450, Cl. 355-38.000.

Taniguchi, Hideki: *See*—
Isaoya, Kohshiro; Abe, Hiroshi; Aikawa, Jun; Taniguchi, Hideki; and Nishimoto, Uichiro, 5,488,168, Cl. 564-506.000.

Taniguchi, Osamu; Inoue, Hiroshi; Mizutome, Atsushi; Mihara, Tadashi; Onitsuka, Yoshihiro; and Terada, Masahiro, to Canon Kabushiki Kaisha. Liquid crystal apparatus. 5,488,388, Cl. 345-97.000.

Tanimoto, Masahiro: *See*—
Takanashi, Hiroshi; Ogura, Masumi; and Tanimoto, Masahiro, 5,488,497, Cl. 359-74.000.

Tanioka, Kenkichi: *See*—
Yamagishi, Toshio; Narita, Masakazu; Egami, Norifumi; Tanioka, Kenkichi; Kawashige, Mitsuhiro; Tsuji, Kazutaka; Kaneko, Yoshiyuki; Makishima, Tatsuo; Nagayasuma, Kazuyuki; Okubima, Tetsuya; and Nakano, Yasushi, 5,488,386, Cl. 345-74.000.

Tangvet, James D., to Litton Systems, Inc. Radio frequency absorbing windows. 5,488,371, Cl. 342-1.000.

Tannous, Francis: *See*—
Azimioyan, Alain A.; and Tannous, Francis, 5,487,269, Cl. 60-274.000.

Tashiro, Kunitami: *See*—
Murata, Satoru; Kawabata, Atsushi; Miura, Shunichi; Tashiro, Kunitami; Morooka, Yasuo; Yahiro, Masakazu; Katahira, Masaki; and Kera, Kazuo, 5,487,516, Cl. 240-182.000.

Tashiro, Yoshio: *See*—
Yabe, Hiroo; Ida, Yoshihiro; Suzuki, Akira; Ito, Hideo; Tashiro, Yoshio; Yamazaki, Minoru; and Tamada, Osamu, 5,487,376, Cl. 600-121.000.

Tayco Developments, Inc.: *See*—
Klembczyk, Alan R., and Metzger, John C., 5,487,454, Cl. 188-298.000.

Taylor, Dana H.: *See*—
Cahill, Douglas A.; Brault, Donald A.; Hinmanlwright, Richard S.; and Taylor, Dana H., 5,488,455, Cl. 355-202.000.

Taylor, Donald R. Soil injection system. 5,487,346, Cl. 111-127.000.

Taylor, Gary N.: *See*—
Shatton, Richard S.; Taylor, Gary N.; and Wheeler, David R., 5,487,947, Cl. 430-322.000.

Taylor, James L.: *See*—
Miller, J. Clayton; Harvey, Michael; Taylor, James L.; Clark, Thomas; and Dawson, Gerry, 5,487,290, Cl. 70-305.00A.

Taylor, Jeffrey L.: *See*—
Springmann, Arthur W.; and Taylor, Jeffrey L., 5,488,673, Cl. 356-317.000.

Taylor, Robert T.: *See*—
Carman, Margaret L.; Jackson, Kenneth J.; Knapp, Richard B.; Kuczenski, John F.; Shah, Nilesh N.; and Taylor, Robert T., 5,487,834, Cl. 210-600.000.

Taylor, Ronald P.; Sutherland, William M.; Boist, Craig; Wright, Eleanor L.; Webb, Dennis; and Labuguen, Ronald, to University of Virginia Patent Foundation. Monomolium pinnatum erythrocyte bound heterodimerized monoclonal antibodies and methods of use thereof. 5,487,890, Cl. 424-136.100.

Taylor, Wayne A.; Hratten, Richard C.; and Imamiika, David J., to University of California Office of Technology Transfer, The Regents of the. Production of sodium 22 from proton irradiated aluminum. 5,487,880, Cl. 423-2.000.

TDK Corporation: *See*—
Kurihayashi, Isamu; and Tezuka, Shin-ichi, 5,487,926, Cl. 428-33.000.

TechnoView Inc.: *See*—
Brown, Eric W.; and Littlefield, James A., 5,488,368, Cl. 341-119.000.

Tegtler, John J.; Rauckman, Barbara S.; Hansen, Russell R. L.; Freed, Brian S.; and Mortisman, Gregory H., to Hoechst-Roussel Pharmaceuticals Inc. 1-alkyl-, 1-alkenyl-, and 1-alkynylaryl-2-amino-1,3-propanediols and related compounds. 5,488,061, Cl. 514-372.000.

Tegtler, John J.; Rauckman, Barbara S.; Hansen, Russell R. L.; Freed, Brian S.; and Mortisman, Gregory H., to Hoechst-Roussel Pharmaceuticals Inc. 1-alkyl-, 1-alkenyl-, and 1-alkynylaryl-2-amino-1,3-propanediols and related compounds. 5,488,063, Cl. 514-438.000.

Tekavec, James E.; and Simmons, James A., to Rampak Corp. Dispensing table for a continuing conversion machine. 5,487,717, Cl. 493-352.000.

Tektronix, Inc.: *See*—
Baker, Daniel G.; Parish, Robert W.; and Zink, Scott E., 5,488,310, Cl. 324-648.000.
Burke, Edward P.; and Kassenbrine, Randy C., 5,488,396, Cl. 347-37.000.

Telectronics Pacing Systems, Inc.: *See*—
Lieberfarb, Warren N.; Cookson, Christopher J.; and Ostrover, Lewis S., 5,488,410, Cl. 348-5.500.
MacCarter, Dean J.; Hopper, Don; Cooper, Daniel; and Hassell, Roger, 5,487,753, Cl. 607-017.000.

Telelirektionsiets Forskningsavdeling: *See*—
Bjontegaard, Gisle, 5,488,420, Cl. 348-419.000.

Telefonaktiebolaget L M Ericsson: *See*—
Womble, Brian R., 5,488,648, Cl. 375-13.000.

Telefonaktiebolaget L M Ericsson: *See*—
Johansson, Ted; Leighton, Larry; and Hamberg, Ivar, 5,488,252, Cl. 257-579.000.

Telegenics, Inc.: *See*—
Oliver, Stewart W., 5,488,654, Cl. 379-106.000.

Telor Ophthalmic Pharmaceuticals, Inc.: *See*—
Neufeld, Arthur H., 5,488,050, Cl. 514-236.200.

Terada, Hiroshi: *See*—
Yamamoto, Hajime; and Terada, Hiroshi, 5,488,465, Cl. 355-246.000.

Terada, Kunihiro: *See*—
Nakanishi, Kaoru; Horino, Shinji; Shiono, Kiyoshi; Tanaka, Hiroshi; and Terada, Kunihiro, 5,488,389, Cl. 345-131.000.

Terada, Masahiro: *See*—
Taniguchi, Osamu; Inoue, Hiroshi; Mizutome, Atsushi; Mihara, Tadashi; Onitsuka, Yoshihiro; and Terada, Masahiro, 5,488,388, Cl. 345-97.000.

Teramoto, Satoshi: *See*—
Zhang, Hongyong; and Teramoto, Satoshi, 5,488,000, Cl. 437-21.000.

Teraoka, Hiroyuki: *See*—
Nojiri, Hiromoto; Yakushiji, Kazuyuki; Yoshinaga, Minoru; and Teraoka, Hiroyuki, 5,487,512, Cl. 242-471.000.

Terra Uosel B.V.: *See*—
Holman, Harm W., 5,487,620, Cl. 404-31.000.

Terris, David: *See*—
Redden, James P.; Terris, David; and Olds, Keith A., 5,488,640, Cl. 375-357.000.

Terry, Ronald C.: *See*—
Sovak, Miles; Terry, Ronald C.; Douglass, James G., III; and Bakir, Farid, 5,487,885, Cl. 424-59.000.

Testa, James P.; Horstmann, Jens; and Siahpolo, Hassan, to Sun Microsystems, Inc. Protecting exit packaged ICs during wave solder operations. 5,488,539, Cl. 361-720.000.

Teva Local Holdings & Finance S.A.: *See*—
Herbrecher, Uwe; Liebram, Udo; Reil, Wilhelm; and Sattler, Peter, 5,487,253, Cl. 53-281.000.

Texaco Chemical Inc.: *See*—
Knifton, John F.; Mauquis, Edward T.; and Dai, Pei-Shing E., 5,488,178, Cl. 568-578.000.
Knifton, John F.; Mauquis, Edward T.; and Dai, Pei-Shing E., 5,488,179, Cl. 568-578.000.

Texas Instruments: *See*—
Vaippey, Sridhar; Krause, Paul W.; and Buch, John M., 5,488,318, Cl. 326-46.000.

Texas Instruments Deutschland GmbH: *See*—
Elmer, Werner, 5,488,288, Cl. 323-284.000.

Texas Instruments Incorporated: *See*—
Gove, Robert J.; Doherty, Donald B.; Heimbuch, Scott D.; Urbanus, Paul M.; and Marshall, Stephen W., 5,488,431, Cl. 348-716.000.
Havemann, Robert H.; Jeng, Shin-Puu; Gnade, Bruce E.; and Cho, Chih-Chen, 5,488,015, Cl. 437-195.000.
Hutu, Dwaine S.; and Feuchtwanger, Guenther, 5,488,376, Cl. 342-42.000.
Mahant-Shetti, Shivaling S.; Agarwala, Manisha; Mehendale, Mahesh M.; Landers, Robert J.; and Harward, Mark G., 5,488,315, Cl. 326-37.000.
Seidhar, Thirumalai, 5,488,613, Cl. 371-22.300.
Webster, William S.; and Wilmeth, David D., 5,488,317, Cl. 326-45.000.

Tezuka, Shin-ichi: *See*—
Kurihayashi, Isamu; and Tezuka, Shin-ichi, 5,487,926, Cl. 428-33.000.

Thap, Dwayne E.: *See*—
Maley, Dale C.; and Thap, Dwayne E., 5,488,340, Cl. 335-253.000.

Thap, Russell C.: *See*—
Olson, Mark W.; Powell, Joe R.; Thap, Russell C.; and Walter, Stephen A., 5,488,218, Cl. 219-492.000.

Themistocleous, Themistocles: *See*—
Hutchin, Graham J.; Themistocleous, Themistocles; and Copperthwaite, Richard G., 5,488,165, Cl. 564-479.000.

Therm-O-Disc, Incorporated: *See*—
Gurski, Michael T., 5,488,347, Cl. 337-380.000.

Thevenet, Bruno; and Gille, Denis, to Prolectrin. Method allowing the incorporation of a metallic structure into a plastic. 5,487,804, Cl. 156-148.000.

Thiel, David: *See*—
Schneider, Fred B.; Lampson, Butler; Balkovich, Edward; and Thiel, David, 5,488,716, Cl. 395-182.080.

Thierry, Jean-Francois: *See*—
Brun, Daniel; Lehary, Pierre-Yves; and Thierry, Jean-Francois, 5,488,155, Cl. 562-554.000.

Thinkel Corporation: *See*—
Dillehay, David R.; Turner, David W.; Wingfield, Horace L., III; and Blackwell, James A., 5,487,851, Cl. 264-3.300.

Thiner, Alain: *See*—

Moinard, Patrice; Thioux, Alain; and Mery, Jean Claude, 5,487,452, Cl. 188-72.700.
THK Co., Ltd.: *See—*
Asada, Makoto, 5,487,609, Cl. 384-18.000.
Thoman, Gregory E.: *See—*
Brackett, Anne W.; Durham, Marcus O.; Perkins, Lynn K.; and Thoman, Gregory E., 5,487,300, Cl. 73-61.590.
Thomas, Gareth J.: *See—*
Parkes, Kevin E. B.; Redshaw, Sally; and Thomas, Gareth J., 5,488,115, Cl. 549-34.000.
Thomas J. Lipton Co., Division of Conopco, Inc.: *See—*
Zabel, Dale D.; Brown, Charles B.; and Cassetta, James V., 5,487,909, Cl. 426-574.000.
Zabel, Dale D.; Brown, Charles B.; and Cassetta, James V., 5,487,910, Cl. 426-574.000.
Thomas, Kirk R.: *See—*
Capecchi, Mario R.; and Thomas, Kirk R., 5,487,992, Cl. 435-172.300.
Thomcast: *See—*
Wolk, Ivan, 5,488,334, Cl. 333-22.00F.
Thompson, Bennie: *See—*
Knodel, Bryan D.; Thompson, Bennie; and Nuchols, Richard P., 5,487,500, Cl. 227-181.100.
Thompson, Bradley J. Vehicle water spray diverter. 5,487,565, Cl. 280-848.000.
Thompson, Daniel L.: *See—*
Dawson, Gerald L.; and Thompson, Daniel L., 5,488,660, Cl. 380-24.000.
Hamilton, James E.; Dawson, Gerald L.; and Thompson, Daniel L., 5,488,358, Cl. 340-825.310.
Thompson, Jon E. Subsurface tool. 5,487,432, Cl. 175-20.000.
Thompson, Mac A.: *See—*
Selsing, Jorgen; and Thompson, Mac A., 5,488,199, Cl. 174-73.100.
Thompson, Todd G. Workman's material support vest for supporting cylinders. 5,487,190, Cl. 2-102.000.
Thomson Consumer Electronics, Inc.: *See—*
Griepentrog, Dal F., 5,488,417, Cl. 348-379.000.
Thomson-CSF: *See—*
Bardy, Marie-Claude, 5,488,381, Cl. 342-372.000.
Bonniau, Philippe; and Chazelas, Jean, 5,487,484, Cl. 220-201.000.
Thorne, David L.: *See—*
Thorne, Gale H.; and Thorne, David L., 5,487,734, Cl. 604-195.000.
Thorne, Gale H.; and Thorne, David L., to Specialized Health Products, Inc. Self retracting catheter needle apparatus and methods. 5,487,734, Cl. 604-195.000.
Thornton, Jeffrey W.; Eckerman, Christer S.; Ekman, Rainer O.; and Holmbom, Bjarne R., to Mesta-Serla Oy. Treatment of alkaline bleached mechanical wood pulp with pectinase. 5,487,812, Cl. 162-72.000.
Thoulon, Pierre-Yves, to Hewlett-Packard Company. Method and apparatus for transition encoding a logic signal. 5,488,628, Cl. 375-239.000.
Thrash, Robert J.; and Johnson, Leo F., to Amoco Corporation. Rare earth ion upconversion laser system. 5,488,624, Cl. 372-41.000.
Thurm, Kenneth R. Motorcycle torsion suspension system. 5,487,443, Cl. 180-227.000.
Thurm, Siegfried; Sommer, Klaus; Bier, Peter; Elschner, Andreas; Kowitz, Manfred; and Sandquist, Axel, to Bayer AG. Process for pretreating surfaces of plastic items. 5,487,810, Cl. 216-67.000.
Thyssen Aufzuge GmbH: *See—*
Scholtkopf, Karl-Otto; Böhm, Werner; Kellings, Gerhard; Boilerott, Michael; and Scherer, Klaus, 5,487,448, Cl. 187-247.000.
Tibbet, Michael D., to Glaser Tool Co. Workpiece holding assembly. 5,487,538, Cl. 269-71.000.
Tice, Bill, to ETI Systems. Control circuit for feedback, motor-operated valve. 5,488,275, Cl. 318-468.000.
Tilley, T. Don; and Imori, Toru, to University of California, The Regents of the. High molecular weight polystannanes by metal-catalyzed dehydropolymerization. 5,488,091, Cl. 528-9.000.
Timex Corporation: *See—*
Jacobs, Michael A.; and Insero, Mark A., 5,488,571, Cl. 364-705.070.
Tindall, David; and Sarjeant, Malcolm, to Spectus Limited. Integrated spectral flame monitor. 5,488,355, Cl. 340-578.000.
Titcomb, Forrest: *See—*
Seaver, Jay R.; Diel, Mark A.; and Titcomb, Forrest, 5,488,523, Cl. 360-99.120.
Tobiyama, Yoichi; Kato, Chiaki; Morito, Nobuyuki; and Kimura, Hajime, to Kawasaki Steel Corporation. Method of manufacturing of galvanized steel sheet having high press formability. 5,487,919, Cl. 427-327.000.
Tocchini, Francesco: *See—*
Stroppolo, Federico; Bonadeo, Daniele; Tocchini, Francesco; and Gazzaniga, Annibale, 5,488,069, Cl. 514-772.400.
Tockman, Bruce A.: *See—*
Salo, Rodney W.; Spinelli, Julio C.; and Tockman, Bruce A., 5,487,752, Cl. 607-17.000.
Tokano, Yuichi, to Tokin Corporation. Electric field sensor. 5,488,677, Cl. 385-3.000.
Tokin Corporation: *See—*
Tokano, Yuichi, 5,488,677, Cl. 385-3.000.
Tokinaga, Yoshito: *See—*
Endo, Sadao; Tokinaga, Yoshito; and Sasaki, Kazuo, 5,487,441, Cl. 180-181.000.
Tokyo Electron Kabushiki Kaisha: *See—*
Horiike, Yasuhiro; and Fukasawa, Takayuki, 5,487,785, Cl. 118-723.00E.
Tokyo Nisshin Jahara Co., Ltd.: *See—*
Tsukada, Ken, 5,487,799, Cl. 156-71.000.
Tokyo Seimitsu Co., Ltd.: *See—*
Tsuta, Kiyoaki, 5,488,292, Cl. 324-158.100.
Tolliver, Wilbur E.; and Magnuson, Larry R., to Independent Concrete Pipe. Apparatus and method for reinforcing cast structures. 5,487,251, Cl. 52-600.000.
Tolo, Inc.: *See—*
Lockshaw, James J.; Kelly, Stephen; Walker, Randall; and Kaiser, John, Jr., 5,487,930, Cl. 428-53.000.
Tomco$_2$ Equipment Co.: *See—*
Shane, Tommy J., 5,487,835, Cl. 210-74.900.
Tomei Sangyo Kabushiki Kaisha: *See—*
Kamiya, Hideaki; Hashimoto, Satoshi; and Matumoto, Satoru, 5,487,788, Cl. 134-1.000.
Tomita, Hironori; Nakamura, Tohru; Wada, Takuya; and Nakamura, Hiroyuki, to Matsushita Electric Industrial Co., Ltd. Optical information recording reproducing apparatus with first and second electrokinetic transducers at respective distances. 5,488,603, Cl. 369-219.000.
Tonka Corporation: *See—*
Mowrer, Kevin B.; and Beck, Robert L., 5,487,692, Cl. 446-465.000.
Toray Industries, Inc.: *See—*
Kadoi, Sho; Yabe, Hidemi; and Kobayashi, Kazuhiko, 5,488,084, Cl. 524-423.000.
Nojiri, Hironobu; Yakushiji, Kazuyuki; Yoshinaga, Minoru; and Terasaka, Hiroyuki, 5,487,512, Cl. 242-471.000.
Torrent Trading Ltd.: *See—*
Kerger, Leon, 5,487,404, Cl. 137-413.000.
Torres, Fernando: *See—*
Michal, Ronald J.; and Torres, Fernando, 5,488,683, Cl. 385-98.000.
Torrington Company, The: *See—*
Waskiewicz, Walter P., 5,487,613, Cl. 384-539.000.
Toshiba Battery Co., Ltd.: *See—*
Kasahara, Shigeo; Sueoka, Kiyoshi; Takayama, Gen; Satoh, Shingo; and Houjyou, Hidemi, 5,487,417, Cl. 141-32.000.
Tosoh Akzo Corporation: *See—*
Ikeda, Yoshihiko; Yamane, Takeo; Kaji, Eiichi; and Ishimaru, Kenji, 5,488,169, Cl. 568-3.000.
Totsuka, Mitsuhiko: *See—*
Kondo, Hiroki; Totsuka, Mitsuhiko; and Kudo, Toshiharu, 5,488,346, Cl. 337-198.000.
Touzard, Benoit M. F.: *See—*
Shutt, John R.; and Touzard, Benoit M. F., 5,488,078, Cl. 524-71.000.
Tower Tech, Inc.: *See—*
Curtis, Harold D., 5,487,531, Cl. 261-30.000.
Curtis, Harold D., 5,487,849, Cl. 261-30.000.
Towers, Kenneth S.: *See—*
Rivard, Robert M.; Schneider, Michael J.; Pattantyus, Tamas I.; Towers, Kenneth S.; and Phipps, Jack R., 5,487,598, Cl. 303-166.000.
Toy, Raymond L.: *See—*
Chennakesha, Sandeep; Koilpillai, Ravinder D.; and Toy, Raymond L., 5,488,635, Cl. 375-340.000.
Toyota, Hiromichi; and Iwanaga, Masao, to I.T.M. Corporation. Powder feeding apparatus, electrostatic powder coating apparatus and powder flow-rate measuring apparatus. 5,487,624, Cl. 406-14.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Takeda, Masashi; Fukuhara, Kazuyuki; and Murakami, Motoichi, 5,487,364, Cl. 123-193.600.
Trabey, Gregg E.; Kornguth, Phyllis; Nightingale, Kathryn; and Walker, William F., to Duke University. Method and apparatus for distinguishing between solid masses and fluid-filled cysts. 5,487,387, Cl. 128-660.020.
Tran, Minh N.: *See—*
Asgari, Jahanbakhsh; Tran, Minh N.; and Hrovat, Davorin D., 5,488,555, Cl. 364-424.050.
Tranter, Inc.: *See—*
Davison, Roger C., 5,487,424, Cl. 165-166.000.
Trewella, Jeffrey C.: *See—*
Brown, Stephen H.; and Trewella, Jeffrey C., 5,488,186, Cl. 568-897.000.
Trident MicroSystems, Inc.: *See—*
Singhal, Dave M.; and Li, Sidong, 5,488,385, Cl. 345-3.000.
Trippensee Corporation: *See—*
Phillips, William H., 5,487,314, Cl. 73-864.660.
Troglia, Claudio: *See—*
Cavallotti, Claudio; Troglia, Claudio; and Garaffa, Roberto, 5,487,818, Cl. 203-41.000.
Truchsess, Joseph: *See—*
Simmel, Thomas L.; McDarren, Robert S.; and Truchsess, Joseph, 5,487,925, Cl. 428-19.000.
Truckai, Csaba; Jaraczewski, Richard S.; Nguyen, Frank; and West, Scott H., to Medtronic CardioRhythm. Multicurve deflectable catheter. 5,487,757, Cl. 607-122.000.
Trustees of Columbia University In The City of New York: *See—*
Modak, Shanta; and Sampath, Lester, 5,487,896, Cl. 424-402.000.
TRW Inc.: *See—*
Headley, Paul S., 5,487,559, Cl. 280-735.000.
Injeyan, Hagop; and Holcomb, Terry L., 5,488,619, Cl. 372-12.000.
TRW Vehicle Safety Systems Inc.: *See—*
Emambakhsh, Al S., 5,487,560, Cl. 280-740.000.

Hisbon, Michael K.; and Stoll, Steven, 5,487,515, Cl. 242-383.400.
Jenkins, Jeffrey A.; and Wiers, John W., 5,487,556, Cl. 280-728.200.

Tsuchiko, Masayoshi: *See*—
Wakabayashi, Naoto; Tsuchiko, Masayoshi; Akama, Terufumi; Maekawa, Hiromi; Shikata, Hiroyuki; Yamazaki, Nobuo; and Kawaguchi, Tomio, 5,487,366, Cl. 128-660.010.

Tsuchiya, Keiji: *See*—
Tanaka, Hirokazu; and Tsuchiya, Keiji, 5,488,718, Cl. 395-600.000.

Tsuchiya, Tetsuo: *See*—
Ozaki, Takahiro; Masukawa, Tomoo; Goto, Fumio; and Tsuchiya, Tetsuo, 5,487,837, Cl. 252-25.000.

Tsuda, Tadayuki; Sekine, Kazumi; Ikemoto, Isao; Watanabe, Kazushi; Sasago, Yoshikazu; Shimizu, Yasushi; Noda, Shinya; and Kobayashi, Kazunori, to Canon Kabushiki Kaisha. Image bearing member having an asymmetrically weighted base, process cartridge and image forming apparatus. 5,488,459, Cl. 355-211.000.

Tsuji, Kazutaka: *See*—
Yamagishi, Yoshio; Naoba, Masakazu; Egami, Norifumi; Tanioka, Kenichi; Kawashige, Mitsuhiro; Tsuji, Kazutaka; Kaneko, Yoshiyuki; Makishima, Tatsuo; Nagatsuma, Kazuyuki; Okubima, Tetsuya; and Nakano, Yasushi, 5,488,386, Cl. 345-74.000.

Tsuji, Masanori; Kashiyama, Ichirohisa; and Kitamura, Takuya, to Yazaki Corporation. Connector housing having a lock mechanism. 5,487,678, Cl. 439-352.000.

Tsujimura, Ayumi: *See*—
Yoshii, Shigeo; Okawa, Kazuhiro; Tsujimura, Ayumi; and Mitsuyo, Tsuneo, 5,488,234, Cl. 257-94.000.

Tsujita, Kouichirou: *See*—
Hayashida, Yoshio; and Tsujita, Kouichirou, 5,488,346, Cl. 257-336.000.

Tsukada, Ken, to Tokyo Nissan Jukan Co., Ltd. Method of preventing fire in ship engine room by wrapping protected area with a laminated material. 5,487,799, Cl. 156-71.000.

Tsukada, Yutaka, to International Business Machines Corporation. Interconnect structure with replaced semiconductor chips. 5,488,200, Cl. 174-261.000.

Tsukamoto, Seiichi: *See*—
Takahashi, Tadashi; Fujita, Takashi; Nakamura, Kazuo; and Tsukamoto, Seiichi, 5,488,022, Cl. 502-115.000.

Tsumori, Hidesuri; and Nakata, Toshimitsu, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Bifunctional aromatic cyanates, prepolymers and electrical laminates made therefrom. 5,488,144, Cl. 560-301.000.

Tsunoda, Tetsujiro, to Kabushiki Kaisha Toshiba. Semiconductor device with interconnect substrates. 5,488,256, Cl. 257-723.000.

Tsuruda, Mitsumasa: *See*—
Ozaki, Masamichi; Takawaki, Mamoru; Miyamoto, Katsuyuki; and Tsuruda, Mitsumasa, 5,487,252, Cl. 53-212.000.

Tsuruta, Kazuhiro; Himi, Hiroaki; Arai, Akiyoshi; and Fujino, Seiji, to Nippondenso Co., Ltd. SOI MOSFET with floating gate. 5,488,243, Cl. 257-314.000.

Tsuta, Kiyoshi, to Tokyo Seimitsu Co., Ltd. Wafer inspecting system. 5,488,292, Cl. 324-158.100.

Tzynbalov, Sofya: *See*—
Chrusciel, Robert A.; Hagen, Timothy J.; Hallinan, E. Ann; Li, Jinglin; Tzynbalov, Sofya; and Reitz, David B., 5,488,046, Cl. 514-211.000.

Tung, Samuel S.: *See*—
Shiu, Almon S.; Tung, Samuel S.; and Gasterf, Robert J., 5,487,394, Cl. 128-846.000.

Tura, Drew. Interlocking frame system for lithium-polymer battery construction. 5,487,958, Cl. 429-151.000.

Turner, David W.: *See*—
Dillehay, David R.; Turner, David W.; Wingfield, Horace L., III; and Blackwell, James A., 5,487,851, Cl. 264-3.300.

Turtle, Howard R.; Morton, Gerald J.; and Lantz, F. Kinley, to West Publishing Company. System of document representation retrieval by successive iterated probability sampling. 5,488,725, Cl. 395-600.000.

Tustin, Patricia: *See*—
Murphy, Alan S.; and Tustin, Patricia, 5,488,686, Cl. 395-161.000.

Tyrrell, Christopher M.; Wills, David R.; Gardiner, David V.; and Landymore, Barry W., to Anglia Autoflow Limited. Treatment of poultry. 5,487,699, Cl. 452-66.000.

Tyus, Lisa A.: *See*—
Hedderly, Gregory T.; Tyus, Lisa A.; and Brown, Leonard M., 5,487,562, Cl. 280-777.000.

U S WEST Technologies, Inc.: *See*—
Hamlen, Glen A., 5,488,655, Cl. 379-114.000.

Uchida, Hideki: *See*—
Sato, Osamu; Hayami, Toshihisa; Ohashi, Hideki; Izawa, Makoto; Serizawa, Tomoaki; and Uchida, Hideki, 5,488,546, Cl. 362-61.000.

Uchida, Takashi: *See*—
Mitomi, Tatsuo; Aoki, Tomohiro; Murayama, Yasushi; Uchida, Takashi; Kobayashi, Toru; Ikkatai, Masatoshi; and Nemura, Masaharu, 5,488,399, Cl. 347-43.000.

Ueda, Tomohiro; Iotow, Takashi; Asamura, Yoshinori; Onishi, Ken; and Mishima, Hidetoshi, to Mitsubishi Denki Kabushiki Kaisha. High-efficiency encoder and video information recording/reproducing apparatus. 5,488,482, Cl. 358-339.000.

Ueda, Tsunesuke; Kusama, Tadao; and Honma, Kazuo, to Kewpie Kabushiki Kaisha. Processed egg powder and process for production thereof. 5,487,911, Cl. 426-614.000.

Uehara, Keiichi; and Hanada, Tooru, to Kabushiki Kaisha Toshiba. Display control system for determining connection of optional display unit by using palette. 5,488,384, Cl. 345-1.000.

Uemura Kogyo Kabushiki Kaisha: *See*—
Griego, Thomas P., 5,487,824, Cl. 205-128.000.

Uhm, Sung J.; Hun, Sung H.; Oh, Jun W.; and Joo, Oh S., to Korea Institute of Science and Technology. Processes for the carbonylation of methanol to form acetic acid, methyl acetate and acetic anhydride. 5,488,143, Cl. 560-232.000.

Uland, David M., to DataSouth Computer Corporation. Method and apparatus for printing linerless media having an adhesive backing. 5,487,337, Cl. 101-288.000.

Ullman, Adam N.: *See*—
Ullman, Noah T.; and Ullman, Adam N., 5,488,362, Cl. 341-20.000.

Ullman, Noah T.; and Ullman, Adam N., to Anaphase Unlimited, Inc. Apparatus for controlling a video game. 5,488,362, Cl. 341-20.000.

Ulm, Horst: *See*—
Svoboda, Anton; Kuhler, Edmund; Ulm, Horst; and Schardt, Gunter, 5,488,261, Cl. 310-249.000.

Ulman, James: *See*—
Snider, Michael T.; High, Kane M.; Panol, Georg; Ulman, James; Richard, Russell B.; Snow, John K.; and Russell, Garfield B., 5,487,727, Cl. 604-49.000.

Umeda, Takashi; and Okamoto, Masaya, to Idemitsu Petrochemical Co., Ltd. Polycarbonate resin composition. 5,488,086, Cl. 525-92.00A.

Umekida, Masaru: *See*—
Komori, Noboru; Kato, Yoshiaki; and Umekida, Masaru, 5,488,527, Cl. 360-122.000.

Umrigar, Pesi P.; and Kuan, Shia S., to United States of America, Health and Human Services. Trapping of aflatoxins and phytoestrogens. 5,487,998, Cl. 436-93.000.

Union Camp Corporation: *See*—
Frentks, Randall C.; and Strouth, Marvin A., 5,488,220, Cl. 219-727.000.

Union Carbide Chemicals & Plastics Technology Corporation: *See*—
Jenkins, Richard D.; Bassett, David R.; Smith, Danny E.; Argyropoulos, John N.; Lofton, James E.; and Shay, Gregory D., 5,488,180, Cl. 568-609.000.

Union Chemical Co., Ltd.: *See*—
Otomo, Shigeru, 5,487,846, Cl. 252-389.610.

Unipal International Corporation: *See*—
Winnberger, Ken N.; and Lee, Stanley M., 5,487,345, Cl. 108-51.300.

Unisia Jecs Corporation: *See*—
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UNISYS Corporation: *See*—
Byers, Larry L.; Doudhjana, Joseba M.; and Michaelson, Wayne A., 5,488,702, Cl. 395-186.000.
Kern, Norman P., 5,488,671, Cl. 382-138.000.
Sauter, Gerald F.; and Stevens, Rick C., 5,488,682, Cl. 385-53.000.
Skidmore, Wendy C., 5,488,714, Cl. 395-500.000.

Unitec Corporation: *See*—
Endo, Sadao; Tokinaga, Yoshito; and Sasaki, Kazuo, 5,487,441, Cl. 180-181.000.

United Microelectronics Corporation: *See*—
Hsue, Chen-Chiu; Shen, Yi-Chung; Sheu, Shing-Ren; and Chung, Chen-Hui, 5,488,009, Cl. 437-52.000.
Yang, Ming-Tzong, 5,488,004, Cl. 437-35.000.

U.S. Narrow Networks, Inc.: *See*—
Walkingshaw, M. Jay; Somerville, Lorne R.; Esdaile, Anthony R.; and Stuart, David J., 5,488,423, Cl. 348-460.000.

United States of America
Administrator, Environmental Protection Agency: *See*—
Safferman, Steven I.; and Bishop, Paul L., 5,487,829, Cl. 210-151.000.
Agriculture: *See*—
Williams, Earl J.; and Adams, Stephen D., 5,488,479, Cl. 356-402.000.
Army: *See*—
Davis, William R.; and Walton, Willard S., 5,487,298, Cl. 73-12.050.
Guativa, Alfonso C.; Schwenk, David M.; and Miller, James P., 5,487,311, Cl. 73-861.770.
Iafrate, Gerald J.; Dutta, Mitra; Shen, Paul H.; and Stroscio, Michael A., 5,488,226, Cl. 250-338.400.
Vig, John R., 5,488,333, Cl. 331-66.000.
Health and Human Services: *See*—
DiFiore, Pier P.; and Fazioli, Francesca, 5,487,979, Cl. 435-240.200.
Umrigar, Pesi P.; and Kuan, Shia S., 5,487,998, Cl. 436-93.000.
Navy: *See*—
DeAngelis, Christopher M., 5,488,589, Cl. 367-131.000.
Friebele, Edward J.; and Kersey, Alan D., 5,488,475, Cl. 356-352.000.
McGraw, Peter S.; and Kelly, Charles M., 5,488,278, Cl. 318-626.000.
Nedderman, William H., Jr, 5,487,351, Cl. 114-332.000.
Nivens, David E.; Chambers, James Q.; and White, David C., 5,487,981, Cl. 435-30.000.
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Quek, Elgin K. B.; Cronquist, Brian E.; and Wei, Che C., 5,488,244, Cl. 257-314.000.
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Wells Cargo, Inc.: *See*—
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Weltmann, Alfred. Lens holder system for eyeglass frame selection. 5,488,439, Cl. 351-58.000.
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Wenthe, Stephen J., Jr.; Plain, Margaret C.; and Rubscha, Robert F., to Xerox Corporation. Constant velocity transport for electronic document imaging. 5,488,464, Cl. 355-233.000.
Wentworth, Steven W.; Crane, Robert F.; and Haas, Jon A., to Earth Tool Corporation. Pneumatic ground-piercing tool and body therefor. 5,487,430, Cl. 173-91.000.
Werner, Alan J., Jr.; Mojaradi, Mohamad M.; Zomorrodi, Mehrdad; Buhler, Steven A.; and Vo, Tuan A., to Xerox Corporation. Electrostatic voltmeter employing a differential cascode. 5,488,301, Cl. 324-458.000.
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Wesselmann, Friedhelm: *See*—
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Weyer, Dean R. Tool actuator with adjustable attachment mount. 5,487,230, Cl. 37-468.000.
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Wilk, Peter J. Entertainment system and associated method. 5,487,706, Cl. 472-54.000.
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Williams, Charlotte I. Tweezer apparatus for use in making stuffed articles. 5,487,578, Cl. 294-99.200.
Williams, Earl J.; and Adams, Stephen D., to United States of America, Agriculture. Machine vision system for inspection of agricultural commodities. 5,488,479, Cl. 356-402.000.
Williams, Fred E., Jr.: *See*—
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Williams, John R.; and Jacobs, Melvin T., to Williams, John R. Temperature indicator for cooked meats. 5,487,352, Cl. 116-218.000.
Williams, Laurence O., to Martin Marietta Corporation. High velocity gun propellant. 5,487,798, Cl. 149-22.000.
Williams, Norman W.: *See*—
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Williamson, Calvin C.; and Salsman, Jeffrey S., to Napa Pipe Corporation. Apparatus and method for destructive testing of coupons formed from metal. 5,487,299, Cl. 73-12.090.
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Wilson, George M. Oral appliances and method. 5,487,663, Cl. 433-218.000.
Wilson, Samantha L. Permanent rod kit and method. 5,487,396, Cl. 132-248.000.
Wilson, Samuel L., to Dayco Products, Inc. Hose assembly, hose coupling and a part therefor and methods of making the same. 5,487,570, Cl. 285-256.000.
Winebarger, Ken N.; and Lee, Stanley M., to Unipal International Corporation. Parametrically wrapped pallet member and pallet constructed thereof. 5,487,345, Cl. 108-51.300.
Winebrenner, Terence M. Self-righting warning marker. 5,487,619, Cl. 404-6.000.
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Dazo, Jeanette; Reiber, Hermon G.; Knighton, Richard; and Peaden, Spurgeon T., 5,487,245, Cl. 52-204.610.
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DeLuca, Hector F.; Schnoes, Heinrich K.; and Aria, Fariba, 5,488,183, Cl. 568-828.000.
Peterson, Reid A.; Hill, Charles G., Jr.; and Anderson, Marc A., 5,487,774, Cl. 95-45.000.
Wise, William D.; De Wever, Marc L.; Kumke, Dale J.; Lumpkin, Everett R.; Sale, Matthew D.; and Schousek, Brian W., to Delco Electronics Corporation. Dual hysteresis method of generating square waves from automotive wheel speed signals. 5,487,595, Cl. 303-168.000.
Witkowski, Joseph T.; Smith, David M.; and Wajer, Mark T., to Martin Marietta Magnesia Specialities Inc. Stabilized, pressure-hydrated magnesium hydroxide slurry from burnt magnesite and process for its production. 5,487,879, Cl. 423-155.000.
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Wolk, Ivan, to Thomcast. Air-cooled power load. 5,488,334, Cl. 333-22.00F.
Womble, Brian R., to Telefonaktiebolaget L M Ericsson. Behavior monitoring and analyzing system for stored program controlled switching system. 5,488,648, Cl. 375-13.000.
Wong, Hon-Sum P., to International Business Machines Corporation. Method of fabricating sidewall charge-coupled device with trench isolation. 5,488,010, Cl. 437-53.000.
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Wood, John R.; and Marin, Constantin, to West Instruments Limited. Apparatus for and method of controlling a process. 5,488,560, Cl. 364-148.000.
Wood, Louis L.; and Calton, Gary J., to Bayer AG. Process for the preparation of copolymers of polysuccinimide. 5,488,088, Cl. 525-432.000.
Wood, Paul B.; and Bounds, Brian F., to Compaq Computer Corporation. High-speed video display system. 5,488,393, Cl. 345-213.000.
Woodruff, Daniel J., to Exabyte Corporation. Picker mechanism for data cartridges. 5,487,579, Cl. 294-115.000.
Woolsey, Kevin G., to Eldec Corporation. Multi-coil impedance. 5,488,566, Cl. 364-488.000.
Wooster, Jeffrey J.: *See*—
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Worchesky, Terrance L.; and Ritter, Kenneth J., to Martin Marietta Corp. Hybridized asymmetric fabry-perot quantum well light modulator. 5,488,504, Cl. 359-248.000.
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Wright, Graham; and Pauly, John M., to Leland Stanford University, Board of Trustees of the. Apparatus and method for decreasing magnetic field sensitivity of long RF pulses. 5,488,298, Cl. 324-309.000.
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Wu, Chi, to Northern Telecom Limited. Polarization independent wavelength tunable filter based on birefringence compensation. 5,488,679, Cl. 385-15.000.
Wu, Donald. Joystick switch assembly. 5,488,206, Cl. 200-6.00A.
Wu, Druong-Yow, to Industrial Technology Research Institute. Segmented variable length decoding apparatus for sequentially decoding single code-word within a fixed number of decoding cycles. 5,488,366, Cl. 341-67.000.
Wu, Margaret M.: *See—*
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Wu, Ping-Hua. Lock assembly for anti-theft device for vehicle. 5,487,286, Cl. 70-52.000.
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Glassner, Andrew, 5,488,700, Cl. 395-126.000.
Godlove, Ronald E.; Jordan, Venita A.; McCumiskey, Robert E.; Yuh, Huoy-Jen; and Zaman, Kamran U., 5,488,460, Cl. 355-211.000.
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Yamada, Akira, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device including bit check function and testing method using the same. 5,488,578, Cl. 365-49.000.
Yamada, Eiji; and Takeuchi, Hitoshi, to Sharp Kabushiki Kaisha. Digital data detector. 5,488,636, Cl. 375-340.000.
Yamada Electric Ind. Co., Ltd.: *See—*
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Yamamoto, Hajime; and Terada, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Electrophotographic developing method using magnetic developing material and apparatus employed therefor. 5,488,465, Cl. 355-246.000.
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Yamamoto, Koji; Hanafusa, Masahiro; Onuma, Fumio; and Nishimura, Michio, to Omron Corporation. Cell analyzing apparatus. 5,488,469, Cl. 356-72.000.
Yamamoto, Mikio; Yamashita, Keitaro; and Kiriyama, Katsunobu, to Hitachi Metals, Ltd. Permanent magnet member and method of producing same. 5,488,341, Cl. 335-302.000.
Yamamoto, Ronald K.: *See—*
Dapper, Gregory S.; and Yamamoto, Ronald K., 5,487,895, Cl. 424-278.100.
Yamamoto, Shigeru; Matsushita, Shigenori; Zhang, Shu huai; Nishita, Satoru; and Nakata, Kazushi, to Kabushiki Kaisha Komatsu Seisakusho. Straight-ahead traveling control system for a bulldozer. 5,487,428, Cl. 172-4.500.
Yamamoto, Yoshihiro: *See—*
Chida, Atsushi; Sannomiya, Hitoshio; Nomoto, Katsuhiko; Okamoto, Hiroshi; and Yamamoto, Yoshihiro, 5,487,786, Cl. 118-723.00E.
Yamanaka, Yutaka, to NEC Corporation. Differential optical switch for data multiplexing in an optical fiber loop of an optical information storage apparatus. 5,488,600, Cl. 369-116.000.
Yamanashi, Makoto, to Yazaki Corporation. Method and structure for fixing a connector to a vehicle body panel. 5,487,680, Cl. 439-552.000.
Yamane, Takeo: *See—*
Ikeda, Yoshihiko; Yamane, Takeo; Kaji, Eiichi; and Ishimaru, Kenji, 5,488,169, Cl. 568-3.000.
Yamane, Takeshi: *See—*
Imashiro, Yasuo; Horie, Naofumi; and Yamane, Takeshi, 5,488,170, Cl. 568-12.000.
Yamano, Akihiko; Nose, Hiroyasu; Kawase, Toshimitsu; Miyazaki, Toshihiko; and Oguchi, Takahiro, to Canon Kabushiki Kaisha. Information record/reproducing apparatus and information recording medium. 5,488,602, Cl. 369-126.000.
Yamashita, Keitaro: *See—*
Yamamoto, Mikio; Yamashita, Keitaro; and Kiriyama, Katsunobu, 5,488,341, Cl. 335-302.000.
Yamashita, Yukihiro; Ikuta, Kenji; and Isomura, Shigenori, to Nippondenso Co., Ltd. Air-fuel ratio control system for internal combustion engine. 5,487,270, Cl. 60-276.000.
Yamato, Kunitada; Fuji, Masato; and Fukuda, Naohiro, to Kawasaki Jukogyo Kabushiki Kaisha. Robot operation training system. 5,488,689, Cl. 395-99.000.
Yamatoya, Kazuhiko: *See—*
Uno, Yoichiro; Takeno, Fumio; Yamatoya, Kazuhiko; and Ohtsu, Keiji, 5,488,105, Cl. 536-128.000.
Yamazaki, Fumio: *See—*
Mizuta, Akira; and Yamazaki, Fumio, 5,487,802, Cl. 156-73.100.
Yamazaki, Hiroshi: *See—*

Sato, Makoto; Yamazaki, Hiroshi; Kotabe, Noriko; Osakabe, Yoshio; Kusagaya, Yasuo; Tanaka, Shigeo; Sugiyama, Kouich; and Katsuyama, Akira, 5,488,357, Cl. 340-825.250.

Yamazaki, Kazumi: *See*—
Hara, Takeshi; Hidano, Kouichi; Wakashiro, Teruo; Yamazaki, Kazumi; and Kawakami, Tomoyuki, 5,487,369, Cl. 123-520.000.

Yamazaki, Minoru: *See*—
Yabe, Hisao; Iida, Yoshihiro; Suzuki, Akira; Ito, Hideo; Tashiro, Yoshio; Yamazaki, Minoru; and Tamada, Osamu, 5,487,376, Cl. 600-121.000.

Yamazaki, Nobuo: *See*—
Wakabayashi, Naoto; Tsuchiko, Masayoshi; Akama, Terufumi; Maekawa, Hiromi; Shikata, Hiroyuki; Yamazaki, Nobuo; and Kawaguchi, Tomio, 5,487,386, Cl. 128-660.010.

Yamazaki, Susumu: *See*—
Asabuki, Hiroshi; Fujio, Masayuki; Watanabe, Takashi; Yamazaki, Susumu; and Ishida, Fumiaki, 5,487,639, Cl. 415-55.100.

Yang, Jerry S. C. Multi purpose lamp. 5,488,550, Cl. 362-298.000.

Yang, Ming-Sheng; Cherng, Yu-Show; and Lu, Chien-Te, to Chi Mei Corporation. Liner for a cargo container. 5,487,485, Cl. 220-403.000.

Yang, Ming-Tzong, to United Microelectronics Corporation. SOI by large angle oxygen implant. 5,488,004, Cl. 437-35.000.

Yang, Peichun; Zhu, Wei; and Glass, Jeffrey T., to North Carolina State University. Diamond films on nondiamond substrates. 5,487,945, Cl. 428-408.000.

Yano, Shinsuke: *See*—
Abe, Masahiro; Nanataki, Tsutomu; and Yano, Shinsuke, 5,488,019, Cl. 501-139.000.

Yasuda, John P. Golf training method. 5,487,546, Cl. 273-187.200.

Yasuda, Shigeyuki. Electric power generating element. 5,487,790, Cl. 136-200.000.

Yasuoka, Tatsuhiko: *See*—
Kuji, Takehito; and Yasuoka, Tatsuhiko, 5,487,414, Cl. 139-383.00A.

Yau, Leopoldo D.: *See*—
Chambers, Stephen; Brown, Brian J.; Chern, Chan-Hong; Chau, Robert; and Yau, Leopoldo D., 5,488,003, Cl. 437-31.000.

Yau, Yeong J. Perching rod for bird cage. 5,487,360, Cl. 119-26.000.

Yazaki Corporation: *See*—
Kondo, Hiroki; Totsuka, Mitsuhiko; and Kudo, Toshiharu, 5,488,346, Cl. 337-198.000.
Sawada, Yoshitsugu, 5,487,686, Cl. 439-884.000.
Seki, Yoshinobu; Kawaguchi, Kenichiro; Oozono, Gen; Sugiyama, Akio; and Oikawa, Ryuetsu, 5,488,345, Cl. 337-186.000.
Tsuji, Masanori; Kashiyama, Motohisa; and Kitamura, Takuya, 5,487,678, Cl. 439-352.000.
Yamanashi, Makoto, 5,487,680, Cl. 439-552.000.

Yeda Research and Development Co., Ltd.: *See*—
Shamir, Adi, 5,488,664, Cl. 380-54.000.

Yeung, Pak-Ho, to National Semiconductor Corp. Voltage to current converter having feedback for providing an exponential current output. 5,488,289, Cl. 323-312.000.

Yip Tai Toys Industrial Ltd.: *See*—
Chiu, Frank T. S., 5,487,691, Cl. 446-126.000.

Yokotsuka, Isao: *See*—
Aoki, Masaaki; Yokotsuka, Isao; and Ogata, Yoshihiro, 5,488,266, Cl. 313-509.000.

Yokouchi, Atsushi: *See*—
Yabe, Toshikazu; Yamamoto, Atsuhiro; Yokouchi, Atsushi; and Esumi, Kunio, 5,487,840, Cl. 252-62.510.

Yokoyama, Shotaro: *See*—
Mori, Kenichi; and Yokoyama, Shotaro, 5,488,645, Cl. 377-20.000.

Yokoyama, Takaaki; Sasaki, Hirotaka; Ohno, Yumiko; Nakajima, Kentaro; Miura, Yasuhiro; and Mori, Hideki, to Kao Corporation. Method for improving the qualities of meat and meat piece treated thereby. 5,487,903, Cl. 426-56.000.

Yonekawa, Naomichi: *See*—
Ohmi, Tadahiro; Yonekawa, Naomichi; Horiki, Hiroyuki; Kaji, Toshimitsu; Kunimoto, Fumitomo; and Tamaki, Takeo, 5,487,398, Cl. 134-95.100.

Yonemoto, Yoshinobu: *See*—
Shirota, Yasuhiro; Inada, Hiroshi; Yonemoto, Yoshinobu; Wakimoto, Takeo; and Imai, Kunio, 5,487,953, Cl. 428-690.000.

Yoo, Beoung Doo: *See*—
Yoo, Han-Ill; Park, Tae Ho; Kang, Dae Suk; and Yoo, Beoung Doo, 5,487,952, Cl. 428-552.000.

Yoo, Han-Ill; Park, Tae Ho; Kang, Dae Suk; and Yoo, Beoung Doo. Sintered BI2TE3-based thermoelectric materials preventing P- to N-type transition. 5,487,952, Cl. 428-552.000.

Yoo, Tae W. Process for producing moxas. 5,487,883, Cl. 424-40.000.

Yoshida, Masanori: *See*—
Mochizuki, Seiji; Kawakami, Kazuhisa; Nakamura, Masahiro; Ohshima, Keiichi; and Yoshida, Masanori, 5,488,401, Cl. 347-86.000.

Yoshida, Toshihiko: *See*—
Fujii, Yoshiharu; and Yoshida, Toshihiko, 5,488,498, Cl. 359-88.000.

Yoshii, Shigeo; Okawa, Kazuhiro; Tsujimura, Ayumi; and Mitsuyu, Tsuneo, to Matsushita Electric Industrial Co., Ltd. Semiconductor element having bivalent and VI group element and an insulating layer. 5,488,234, Cl. 257-94.000.

Yoshikawa, Masayoshi: *See*—
Takemoto, Takatoshi; Yoshikawa, Masayoshi; Aoyama, Moriyuki; Muramatsu, Meiji; and Kawashima, Kazunari, 5,487,696, Cl. 451-105.000.

Yoshimura, Shuji: *See*—
Kakuma, Satoshi; Yoshimura, Shuji; Hajikano, Kazuo; Murayama, Masami; and Okuyama, Yuzo, 5,488,606, Cl. 370-16.000.

Yoshinaga, Minoru: *See*—
Nojiri, Hironobu; Yakushiji, Kazuyuki; Yoshinaga, Minoru; and Terasaka, Hiroyuki, 5,487,512, Cl. 242-471.000.

Yost, Dennis P.: *See*—
Demarest, David; Duncan, Robert B.; Sobel, Martin; Lenihan, Timothy P.; Rattan, William; Blanch, John F.; Hodulik, Michael G.; and Yost, Dennis P., 5,487,212, Cl. 29-407.000.

Young, Eugene F.; and O'Keefe, Dennis J., to Xerox Corporation. Magnetic compositions with surface additives. 5,487,841, Cl. 252-62.590.

Young, Jeffery L.: *See*—
Hult, David R.; Young, Jeffery L.; and Holsten, Stuart V., 5,487,213, Cl. 29-596.000.

Yount, Patty L.; and Fisher, Jacob E., Jr., to J. P. Walls, Inc. Predecorated wallboard joint and method of joining predecorated wallboards to form a concealed joint. 5,487,250, Cl. 52-417.000.

Yu, Dequan: *See*—
Gaston, Robert D.; and Yu, Dequan, 5,487,650, Cl. 417-423.300.

Yu, George W.; and Holtgrewe, H. Logan. Surgical clip having a longitudinal opening through which clamped tissue protrudes. 5,487,746, Cl. 606-151.000.

Yuen, Henry C.; and Kwoh, Daniel S. Apparatus and method for tracking the playing of VCR programs. 5,488,409, Cl. 348-5.000.

Yugawa, Keiko: *See*—
Shigetoh, Nobuyuki; Miyazaki, Jipsei; Nakayama, Hiroshi; Yugawa, Keiko; and Mitsumata, Tadayasu, 5,488,114, Cl. 548-510.000.

Yuh, Huoy-Jen: *See*—
Godlove, Ronald E.; Jordan, Venita A.; McCumiskey, Robert E.; Yuh, Huoy-Jen; and Zaman, Kamran U., 5,488,460, Cl. 355-211.000.

Yuki, Tadayuki; and Kato, Iku, to Asahi Kasei Kogyo Kabushiki Kaisha. Wrap film containing box and manufacturing method therefor. 5,487,716, Cl. 493-86.000.

Yurman, Richard: *See*—
Bartilucci, Anthony R.; Gilchrist, George W.; and Yurman, Richard, 5,487,864, Cl. 264-219.000.

Zabel, Dale D.; Brown, Charles B.; and Cassetta, James V., to Thomas J. Lipton Co., Division of Conopco, Inc. Process for preparing a meat emulsion containing meat broth. 5,487,909, Cl. 426-574.000.

Zabel, Dale D.; Brown, Charles B.; and Cassetta, James V., to Thomas J. Lipton, Co., Division of Conopco, Inc. Process for preparing a meat emulsion containing meat broth and product thereof. 5,487,910, Cl. 426-574.000.

Zabriskie, Kenneth A.: *See*—
Majeti, Venkata C.; Midani, Mowaffak T.; Watson, Richard J.; and Zabriskie, Kenneth A., 5,488,412, Cl. 348-10.000.

Zaffetti, Mark A.: *See*—
Castonguay, Roger N.; Rosen, James L.; and Zaffetti, Mark A., 5,488,211, Cl. 200-400.000.

Zagar, Paul S.: *See*—
Ong, Adrian E.; Waller, William K.; and Zagar, Paul S., 5,488,583, Cl. 365-201.000.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Kondo, Shinichi; Shibahara, Seiji; Usui, Takayuki; Kudo, Toshiaki; Gomi, Shuichi; Tamura, Atsushi; Ikeda, Yoko; Ikeda, Daishiro; and Takeuchi, Tomio, 5,488,038, Cl. 514-41.000.

Zakman, Zdravko M.: *See*—
Agahi-Kesheh, Darioush; Zakman, Zdravko M.; and Kenoun, Robert, 5,488,335, Cl. 333-206.000.

Zaman, Kamran U.: *See*—
Godlove, Ronald E.; Jordan, Venita A.; McCumiskey, Robert E.; Yuh, Huoy-Jen; and Zaman, Kamran U., 5,488,460, Cl. 355-211.000.

Zambon Group S.p.A.: *See*—
Stroppolo, Federico; Bonadeo, Daniele; Tocchini, Francesco; and Gazzaniga, Annibale, 5,488,069, Cl. 514-772.400.

Zampini, Michael A.; Flum, Alan; Davis, Donald E.; and Dombrowski, Joseph J., to Sony Corporation; and Sony Electronics Inc. Manual cross fade learn feature for an audio follow video mixer. 5,488,669, Cl. 381-119.000.

Zapisek, John: *See*—
McKee, Mark P.; Zapisek, John; Bulfer, David M.; Long, John M.; Nickolls, John R.; and Blank, William T., 5,488,694, Cl. 395-824.000.

Zaun, Kenneth E.: *See*—
DeLiso, Evelyn M.; and Zaun, Kenneth E., 5,488,021, Cl. 502-63.000.

Zayed, Gaith O.: *See*—
Benedict, Lawrence R.; and Zayed, Gaith O., 5,488,458, Cl. 355-206.000.

Zehle, Gunter; Juhnke, Hubert; and Ismar, Thomas T., to Ismar Maschinen GmbH. Process and device for the continuous blending of liquid and/or pourable materials into foodstuff masses. 5,487,605, Cl. 366-300.000.

Zeller, Peter K.: *See*—
Kemner, Axel; Keschwari, Mahmud; and Zeller, Peter K., 5,488,287, Cl. 322-20.000.

Zeller, Robert S., to Millipore Corporation. High-efficiency metal membrane element, filter, and process for making. 5,487,771, Cl. 55-523.000.

Zeofuels Research (Proprietary) Limited: *See*—
Hutchin, Graham J.; Themistocleous, Themistoclis; and Copperthwaite, Richard G., 5,488,165, Cl. 564-479.000.

Zerrer, Ralf: *See*—

Engelhardt, Fritz; Kühlwein, Jürgen; Schuler, Wilfried; Zerrer, Ralf; and Antwerpen, Werner, 5,488,123, Cl. 556-428.000.

Zeuner, Lothar: *See*—
Schlüter, Peter; and Zeuner, Lothar, 5,487,327, Cl. 92-128.000.

Zhang, Hongyong; and Teramoto, Satoshi, to Semiconductor Energy Laboratory Co., Ltd. Method of fabricating a thin film transistor using a nickel silicide layer to promote crystallization of the amorphous silicon layer. 5,488,000, Cl. 437-21.000.

Zhang, Jiming: *See*—
Li, Yi-Oun; and Zhang, Jiming, 5,487,356, Cl. 117-99.000.

Zhang, Shu huai: *See*—
Yamamoto, Shigeru; Matsushita, Shigenori; Zhang, Shu huai; Nishita, Satoru; and Nakata, Kazushi, 5,487,428, Cl. 172-4.500.

Zhou, Xinhua: *See*—
Hayes, John E.; Simroth, Donald W.; and Zhou, Xinhua, 5,488,085, Cl. 525-53.000.

Zhu, Wei: *See*—
Yang, Peichun; Zhu, Wei; and Glass, Jeffrey T., 5,487,945, Cl. 428-408.000.

Zide, Robert M.: *See*—
Zide, Rodney M.; Zide, Robert M.; and Rector, James L., 5,487,187, Cl. 2-2.000.

Zide, Rodney M.; Zide, Robert M.; and Rector, James L. Underarm straps for shoulder pads. 5,487,187, Cl. 2-2.000.

Ziegler, Carl; Fabio, Paul; Bush, Karen; and Steinberg, Deborah, to American Cyanamid Company. Process for preparing 6-[(isoxazolinyl)methyl]penicillanic acid 1,1-dioxide compounds. 5,488,106, Cl. 540-310.000.

Zielinski, James S.: *See*—
Orrico, Mario M. V.; Olson, William J.; Zielinski, James S.; and Crippen, Randall M., 5,488,209, Cl. 200-61.700.

Zijderhand, Frans; and Weling, Alfred L. M., to U.S. Philips Corporation. Method and arrangement for data transmission. 5,488,611, Cl. 370-108.000.

Zimmerman, Thomas G.; and Wantman, Samuel P. Electronic musical re-performance and editing system. 5,488,196, Cl. 84-612.000.

Zimron, Ohad: *See*—
Kedar, Alon; and Zimron, Ohad, 5,487,765, Cl. 55-310.000.

Zink, Scott E.: *See*—
Baker, Daniel G.; Parish, Robert W.; and Zink, Scott E., 5,488,310, Cl. 324-648.000.

Zisman, Stan A.: *See*—
Cheung, Tin-Tack P.; Johnson, Marvin M.; Brown, Scott H.; Zisman, Stan A.; and Kimble, James B., 5,488,024, Cl. 502-325.000.

Zomorrodi, Mehrdad: *See*—
Werner, Alan J., Jr.; Mojaradi, Mohamad M.; Zomorrodi, Mehrdad; Buhler, Steven A.; and Vo, Tuan A., 5,488,301, Cl. 324-458.000.

Zouev, Valerii P.: *See*—
Kourbatov, Vladimir A.; Boreyko, Nataljya P.; Zouev, Valerii P.; and Liakumovich, Alexandr G., 5,488,192, Cl. 585-435.000.

Zuo, Lianghe, to Caterpillar Inc. Injection rate shaping control ported check stop for a fuel injection nozzle. 5,487,508, Cl. 239-533.500.

Zygo Corporation: *See*—
de Groot, Peter, 5,488,477, Cl. 356-359.000.

Zytka, Donald J.; Madden, Peter G.; and Eglinton, Robert B. Minienvironment for material handling. 5,487,768, Cl. 55-385.200.

3DO Company, The: *See*—
Main, David R., 5,488,576, Cl. 364-724.010.

1st Desk Systems, Inc.: *See*—
Gibson, Seann; and Gibson, Kerr, 5,488,717, Cl. 395-600.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30th DAY OF JANUARY, 1996

NOTE— Arranged in accordance with the first significant character or word if the name (in accordance with city and telephone directory practice).

Anthony's Manufacturing Company, Inc.: *See*—
Richardson, Richard J.; and Downing, Bennie R., Re. 35,149, Cl. 52-204.593.

Downing, Bennie R.: *See*—
Richardson, Richard J.; and Downing, Bennie R., Re. 35,149, Cl. 52-204.593.

Fuji Spinning Company, Limited: *See*—
Hirukawa, Tsuguhisa; Tanibe, Hiroaki; and Miyaji, Tuguo, Re. 35,151, Cl. 428-364.000.

Hirukawa, Tsuguhisa; Tanibe, Hiroaki; and Miyaji, Tuguo, to Fuji Spinning Company, Limited. Modified cellulose regenerated fiber comprising chitosan particles. Re. 35,151, Cl. 428-364.000.

Horst, James F.: *See*—
McKenna, Frank J., Jr.; Horst, Richard K.; Horst, James F.; Wright, Charles S.; and Matthews, John D., Re. 35,150, Cl. 56-328.100.

Horst, Richard K.: *See*—
McKenna, Frank J., Jr.; Horst, Richard K.; Horst, James F.; Wright, Charles S.; and Matthews, John D., Re. 35,150, Cl. 56-328.100.

Matthews, John D.: *See*—
McKenna, Frank J., Jr.; Horst, Richard K.; Horst, James F.; Wright, Charles S.; and Matthews, John D., Re. 35,150, Cl. 56-328.100.

McKenna, Frank J., Jr.; Horst, Richard K.; Horst, James F.; Wright, Charles S.; and Matthews, John D., to McKenna: Kathleen. Tray for fruit harvesting system. Re. 35,150, Cl. 56-328.100.

McKenna: Kathleen: *See*—
McKenna, Frank J., Jr.; Horst, Richard K.; Horst, James F.; Wright, Charles S.; and Matthews, John D., Re. 35,150, Cl. 56-328.100.

Miyaji, Tuguo: *See*—
Hirukawa, Tsuguhisa; Tanibe, Hiroaki; and Miyaji, Tuguo, Re. 35,151, Cl. 428-364.000.

Richardson, Richard J.; and Downing, Bennie R., to Anthony's Manufacturing Company, Inc. Railless refrigerator display door. Re. 35,149, Cl. 52-204.593.

Tanibe, Hiroaki: *See*—
Hirukawa, Tsuguhisa; Tanibe, Hiroaki; and Miyaji, Tuguo, Re. 35,151, Cl. 428-364.000.

Wright, Charles S.: *See*—
McKenna, Frank J., Jr.; Horst, Richard K.; Horst, James F.; Wright, Charles S.; and Matthews, John D., Re. 35,150, Cl. 56-328.100.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Antwiler, Glen D., to Cobe Laboratories, Inc. Washing cells. B1 5,141,486, Cl. 494-37.000.

Braslawsky, Gary R.: *See*—
Kaneko, Takeshi; Willner, David; Monkovic, Ivo; Greenfield, Robert S.; and Braslawsky, Gary R., B1 5,137,877, Cl. 514-25.000.

Bristol-Myers Squibb Company: *See*—
Kaneko, Takeshi; Willner, David; Monkovic, Ivo; Greenfield, Robert S.; and Braslawsky, Gary R., B1 5,137,877, Cl. 514-25.000.

Cobe Laboratories, Inc.: *See*—
Antwiler, Glen D., B1 5,141,486, Cl. 494-37.000.

Counselman, Charles C., III, to Western Atlas International, Inc. System for simultaneously deriving position information from a plurality of satellite transmissions. B1 5,014,066, Cl. 342-352.000.

Environ Products, Inc.: *See*—
Webb, Michael C., B1 5,297,896, Cl. 405-52.000.

Greenfield, Robert S.: *See*—
Kaneko, Takeshi; Willner, David; Monkovic, Ivo; Greenfield, Robert S.; and Braslawsky, Gary R., B1 5,137,877, Cl. 514-25.000.

Kaneko, Takeshi; Willner, David; Monkovic, Ivo; Greenfield, Robert S.; and Braslawsky, Gary R., to Bristol-Myers Squibb Company. Bifunctional linking compounds, conjugates and methods for their production. B1 5,137,877, Cl. 514-25.000.

Kaplan, Carl, to Plough, Inc. Substantive topical compositions. B1 4,522,807, Cl. 424-59.000.

Monkovic, Ivo: *See*—
Kaneko, Takeshi; Willner, David; Monkovic, Ivo; Greenfield, Robert S.; and Braslawsky, Gary R., B1 5,137,877, Cl. 514-25.000.

Plough, Inc.: *See*—
Kaplan, Carl, B1 4,522,807, Cl. 424-59.000.

Webb, Michael C., to Environ Products, Inc. Environmentally safe underground piping system. B1 5,297,896, Cl. 405-52.000.

Western Atlas International, Inc.: *See*—
Counselman, Charles C., III, B1 5,014,066, Cl. 342-352.000.

Willner, David: *See*—
Kaneko, Takeshi; Willner, David; Monkovic, Ivo; Greenfield, Robert S.; and Braslawsky, Gary R., B1 5,137,877, Cl. 514-25.000.

LIST OF DESIGN PATENTEES

Ablenet, Inc.: *See*—
Hallgren, Leander; and Petersson, Lisa E., 366,657, Cl. D14-160.000.

ABU AB: *See*—
Storz, Achim, 366,690, Cl. D22-140.000.

Ancona, Bruce, to B. Via International Housewares, Inc. Kettle. 366,589, Cl. D7-320.000.

Anderson, John R. Lemonade stand. 366,634, Cl. D12-102.000.

Antonious, Anthony J. Metal wood golf club head. 366,682, Cl. D21-214.000.

Aptar Group, Inc.: *See*—
Knickerbocker, Michael G., 366,616, Cl. D9-445.000.

Arnette, Gregory F. Sunglasses. 366,666, Cl. D16-325.000.

Arnette, Gregory F. Sunglasses. 366,667, Cl. D16-329.000.

Arthur, Lawrence C. Firefighter rescue and utility belt with detachable carrier. 366,734, Cl. D29-124.000.

Ashby, Ann: *See*—
Ashby, Theodore; and Ashby, Ann, 366,557, Cl. D2-870.000.

Ashby, Theodore; and Ashby, Ann. Soft hat in the shape of a football helmet. 366,557, Cl. D2-870.000.

Avery Dennison Corporation: *See*—
Deschenes, Charles L.; Jones, Terence J.; and Cooper, William J., 366,608, Cl. D8-382.000.

B. Via International Housewares, Inc.: *See*—
Ancona, Bruce, 366,589, Cl. D7-320.000.

Bailey, Jane B. Filing cart for educational assessment portfolios. 366,744, Cl. D34-12.000.

Ballentine, Lester E. Water craft propulsion device with pivoting vane. 366,643, Cl. D12-317.000.

Barry, Michael R.: *See*—
McKinnon, Raymond J., Jr.; and Barry, Michael R., 366,650, Cl. D14-114.000.

Barta, Robert D.: *See*—
Penn, Evan R.; and Barta, Robert D., 366,602, Cl. D7-636.000.

BC-USA, Inc.: *See*—
Fultz, Jerry, 366,613, Cl. D9-429.000.

Becton Dickinson and Company: *See*—
Kirk, Karl D., III; and Toleman, James R., 366,702, Cl. D24-189.000.

Beliard, Claire: *See*—
Sanchez, Russell; Paull, Mike; Kaneko, Steve; Chin, Henry; Dillon, Robert; Knodt, Michael; and Beliard, Claire, 366,655, Cl. D14-114.000.

Benson, Steven R. Snow mobile engine head. 366,660, Cl. D15-5.000.

Berazaluce, Guillen, to Moulinex Societe Anonyme. Combined air purifier and cleaner. 366,695, Cl. D23-364.000.

Bergstresser, William A.: *See*—

Stiehl, Mark A.; Bergstresser, William A.; Niedospial, John J.; Chapman, Raymond P.; Dale, Berle A.; Felts, Richard J.; and Pfaff, Douglas W., 366,698, Cl. D24-114.000.

Berol Corporation: *See—*
Kitzmiller, Sean, 366,671, Cl. D19-53.000.
Kitzmiller, Sean, 366,672, Cl. D19-53.000.

Berry, Richard D., Jr.; and Clark, David A., to Ethen Allen Finance Corporation. Elliptical coffee table. 366,580, Cl. D6-480.000.

Black & Decker Inc.: *See—*
Kaiser, David W., 366,707, Cl. D26-43.000.
Santarsiero, Paul S., 366,708, Cl. D26-43.000.
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CLASS 55

310 5,487,765
356 5,487,766
357 5,487,767
385.2 5,487,768
442 5,487,769
523 5,487,771

CLASS 56

9 5,487,258
298 5,487,259
328.1 Re.35,150
400.04 5,487,260

CLASS 57

9 5,487,261
58.65 5,487,262
58.86 5,487,263

CLASS 59

80 5,487,264

CLASS 60

39.03 5,487,265
39.06 5,487,266
206 5,487,267
274 5,487,268
5,487,269
276 5,487,270
554 5,487,271
602 5,487,273
725 5,487,274
747 5,487,275

CLASS 62

6 5,487,272
125 5,487,276
187 5,487,277
236 5,487,278
474 5,487,279

CLASS 63

12 5,487,280

CLASS 66

13 5,487,281
69 5,487,282

CLASS 68

3 SS 5,487,284
27 5,487,283

CLASS 70

18 5,487,285
52 5,487,286
86 5,487,287
259 5,487,288
279 5,487,289
303 A 5,487,290
456 R 5,487,291

CLASS 71

26 5,487,772

CLASS 72

43 5,487,292
53 5,487,293
370 5,487,294
379.4 5,487,295
381 5,487,296
450 5,487,297

CLASS 73

12.05 5,487,298
12.09 5,487,299
61.59 5,487,300
118.1 5,487,301
168 5,487,302
499 5,487,303
504.07 5,487,304
514.32 5,487,305
597 5,487,306
803 5,487,307
827 5,487,308
861 5,487,309
861.17 5,487,310
861.77 5,487,311
863.01 5,487,312
863.71 5,487,313
864.66 5,487,314
865.9 5,487,315

CLASS 74

527 5,487,316
562.5 5,487,317
606 R 5,487,318

CLASS 75

228 5,487,773

CLASS 83

745 5,487,319

CLASS 84

413 5,487,320
423 R 5,487,321
609 5,488,195
612 5,488,196

CLASS 89

1.56 5,487,322
36.08 5,487,323

CLASS 91

369.1 5,487,324
376 R 5,487,325

CLASS 92

128 5,487,326
5,487,327

CLASS 95

45 5,487,774
98 5,487,775

CLASS 99

390 5,487,328
403 5,487,329
425 5,487,330
504 5,487,331

CLASS 100

93 P 5,487,332

CLASS 101

116 5,487,333
126 5,487,334
181 5,487,335
216 5,487,336
288 5,487,337
454 5,487,338
483 5,487,339
486 5,487,340

CLASS 104

17.1 5,487,341

CLASS 106

18.35 5,487,776
188 5,487,777
287.23 5,487,778
480 5,487,779

CLASS 108

42 5,487,342
51.1 5,487,343
51.3 5,487,344
5,487,345

CLASS 111

127 5,487,346

CLASS 112

242 5,487,347
259 5,487,348

CLASS 114

219 5,487,349
330 5,487,350
332 5,487,351

CLASS 116

218 5,487,352

CLASS 117

4 5,487,353
13 5,487,354
5,487,355
99 5,487,356
104 5,487,357
200 5,487,358

CLASS 118

231 5,487,780
300 5,487,781
621 5,487,782
715 5,487,783
718 5,487,784
723 E 5,487,785
5,487,786
723 R 5,487,787

CLASS 119

14.17 5,487,359
26 5,487,360
28.5 5,487,361

CLASS 123

27 GE 5,487,362
41.74 5,487,363
193.6 5,487,364
306 5,487,365
336 5,487,366
420 5,487,367
470 5,487,368
520 5,487,369
538 5,487,370
572 5,487,371
585 5,487,372
753 5,487,392

CLASS 124

23.1 5,487,373
86 5,487,374
89 5,487,375

CLASS 128

34.4 5,487,927
200.16 5,487,378
201.11 5,487,379
204.15 5,487,380
207.14 5,487,381
5,487,382
207.15 5,487,383
633 5,487,384
642 5,487,385
660.01 5,487,386
660.02 5,487,387
660.09 5,487,388
661.09 5,487,389
662.02 5,487,390
699 5,487,391
760 5,487,393
846 5,487,394
878 5,487,395

CLASS 132

248 5,487,396

CLASS 134

1 5,487,788
6 5,487,397
38 5,487,789
95.1 5,487,398
138 5,487,399

CLASS 135

33.7 5,487,401
87 5,487,400
5,487,402

CLASS 136

200 5,487,790
245 5,487,791
256 5,487,792

CLASS 137

115 5,487,403
413 5,487,404
501 5,487,405
519 5,487,406
522 5,487,407
556.3 5,487,408
625.64 5,487,409
625.65 5,487,410

CLASS 138

98 5,487,411
149 5,487,412

CLASS 139

116.2 5,487,413
383 A 5,487,414
452 5,487,415

CLASS 140

105 5,487,416

CLASS 141

32 5,487,417
392 5,487,418

CLASS 148

111 5,487,794
520 5,487,795
633 5,487,796
672 5,487,797

CLASS 149

22 5,487,798

CLASS 156

64 5,487,801
71 5,487,799
73.1 5,487,802
87 5,487,800
91 5,487,803
148 5,487,804
159 5,487,805
175 5,487,806
259 5,487,809
353 5,487,807
556 5,487,808
656.1 5,487,811

CLASS 162

9 5,487,419
72 5,487,812
111 5,487,813

CLASS 164

97 5,487,420
467 5,487,421

CLASS 165

67 5,487,422
156 5,487,423
166 5,487,424

CLASS 166

295 5,487,425
378 5,487,426
382 5,487,427

CLASS 172

4.5 5,487,428
175 5,487,429

CLASS 173

91 5,487,430

CLASS 174

42 5,488,197
48 5,488,198
73.1 5,488,199
261 5,488,200
262 5,488,201

CLASS 175

20 5,487,431
5,487,432
78 5,487,433
323 5,487,434
363 5,487,435
432 5,487,436

CLASS 177

25.15 5,488,202
184 5,488,203

CLASS 178

18 5,488,204

CLASS 180

6.5 5,487,437
65.1 5,487,438
79.1 5,487,439
164 5,487,440
181 5,487,441
220 5,487,442
227 5,487,443

CLASS 181

129 5,488,205

CLASS 182

6 5,487,444
148 5,487,446
181 5,487,445

CLASS 184

1.5 5,487,447

CLASS 187

247 5,487,448
330 5,487,449
367 5,487,450
392 5,487,451

CLASS 188

72.7 5,487,452
264 G 5,487,453
298 5,487,454
299 5,487,455

CLASS 192

18 A 5,487,456
18 B 5,487,458
58.2 5,487,457

CLASS 194

213 5,487,459

CLASS 198

382 5,487,460
571 5,487,461
594 5,487,462

CLASS 200

6 A 5,488,206
43.04 5,488,207
43.22 5,488,208
61.7 5,488,209
344 5,488,210
400 5,488,211
5,488,212
533 5,488,213

CLASS 203

2 5,487,814
5,487,815
14 5,487,816
38 5,487,817
41 5,487,818

CLASS 204

192.12 5,487,821
298.09 5,487,822
298.12 5,487,823

CLASS 205

128 5,487,824
200 5,487,825
347 5,487,819
716 5,487,820

CLASS 206

145 5,487,463
149 5,487,464
150 5,487,465
214 5,487,466
216 5,487,467
242 5,487,468
308.3 5,487,826
363 5,487,469
522 5,487,470
725 5,487,471

CLASS 209

581 5,487,472

CLASS 210

74.9 5,487,835
87 5,487,827
90 5,487,828
151 5,487,829
169 5,487,830
198.2 5,487,831
232 5,487,832
5,487,833
606 5,487,834
791 5,487,836

CLASS 211

59.1 5,487,473
59.2 5,487,474
70.8 5,487,475
71 5,487,476

CLASS 212

253 5,487,478
270 5,487,479

CLASS 213

43 5,487,480

CLASS 215

252 5,487,481
396 5,487,482

CLASS 216

27 5,487,483
67 5,487,810

CLASS 219

86.25 5,488,215
121.64 5,488,216
137.31 5,488,217
492 5,488,218
627 5,488,214
644 5,488,219
727 5,488,220
765 5,488,221

CLASS 220

201 5,487,484
403 5,487,485
504 5,487,486
509 5,487,487

CLASS 221

150 HC 5,487,488

CLASS 222

1 5,487,489
5,487,490
95 5,487,491
129.1 5,487,492
153.14 5,487,493
158 5,487,494
209 5,487,495
593 5,487,496

CLASS 224

41 5,487,497
224 5,487,498

CLASS 227

175.1 5,487,499
181.1 5,487,500

CLASS 229

87.05 5,487,503
120.17 5,487,504
191 5,487,505
202 5,487,506

CLASS 235

375 5,488,223

CLASS 238

2 5,487,501

CLASS 239

69 5,487,502
391 5,487,507
533.5 5,487,508

CLASS 241

152.2 5,487,509
199.6 5,487,510
282.1 5,487,511

CLASS 242

348.1 5,487,513
383.4 5,487,515
471 5,487,512

CLASS 246

182 C 5,487,516

CLASS 248

215 5,487,517
225.11 5,487,518
311.2 5,487,519
429 5,487,520
441.1 5,487,521
549 5,487,522
551 5,487,523
613 5,487,524
639 5,487,525

CLASS 249

2 5,487,526

CLASS 250

227.16 5,488,224
231.16 5,488,240
236 5,488,225
324 5,488,222
338.4 5,488,226
343 5,488,227
423 R 5,488,228
492.2 5,488,229
548 5,488,230

CLASS 251

62 5,487,527
127 5,487,528
148 5,487,529

CLASS 252

25 5,487,837
49.9 5,487,838
5,487,839
60 5,487,842
62.51 5,487,840
62.59 5,487,841
89.1 5,487,843
175 5,487,844
299.63 5,487,845
389.61 5,487,846
511 5,487,847

CLASS 254

131.5 5,487,530

CLASS 257

17 5,488,231
38.2 5,488,248
77 5,488,232
94 5,488,233
5,488,234
5,488,235
132 5,488,236
194 5,488,237
207 5,488,238
231 5,488,239
273 5,488,241
301 5,488,242
314 5,488,243
5,488,244
316 5,488,245
336 5,488,246
368 5,488,247
401 5,488,249
421 5,488,250
557 5,488,251
579 5,488,252
622 5,488,253
707 5,488,254
718 5,488,255
723 5,488,256
774 5,488,257

CLASS 260

665 R 5,487,848

CLASS 261

30 5,487,531
5,487,849
64.1 5,487,850

CLASS 264

3.3 5,487,851
46.4 5,487,854
63 5,487,855
78 5,487,856
103 5,487,858
5,487,859
5,487,860
134 5,487,861
142 5,487,862
177.11 5,487,863
219 5,487,864
400 5,487,852
496 5,487,853

CLASS 266

271 5,487,532

CLASS 267

140.5 5,487,533
141.1 5,487,534
220 5,487,535

CLASS 269

21 5,487,536
51 5,487,537
71 5,487,538
309 5,487,539

CLASS 273

1.5 A 5,487,540
30 5,487,541
78 5,487,543
138 A 5,487,544
176 FA 5,487,542
178 R 5,487,545
187.2 5,487,546
274 5,487,547
431 5,487,548

CLASS 277

54 5,487,549
65 5,487,550

CLASS 280

11.2 5,487,552
47.19 5,487,551
280 5,487,553
293 5,487,554
403 5,487,555
728.2 5,487,556
728.3 5,487,557
5,487,558
735 5,487,559
740 5,487,560
741 5,487,561
777 5,487,562
806 5,487,563
808 5,487,564
848 5,487,565

CLASS 283

56 5,487,566
72 5,487,567
81 5,487,568

CLASS 285

24 5,487,569
256 5,487,570
259 5,487,571
308 5,487,572
332 5,487,573

CLASS 292

218 5,487,574

CLASS 293

115 5,487,575

CLASS 294

19.1 5,487,576
58 5,487,577
99.2 5,487,578
115 5,487,579
119.1 5,487,580
137 5,487,581
146 5,487,582

CLASS 296

65.1 5,487,583
100 5,487,584
5,487,585
180.1 5,487,586

CLASS 297

219.1 5,487,587
253 5,487,588
342 5,487,589
344.14 5,487,590
452.14 5,487,591

CLASS 301

59 5,487,592

CLASS 303

11 5,487,593
116.2 5,487,597
149 5,487,596
155 5,487,594
166 5,487,598
168 5,487,595

CLASS 307

64 5,488,258

CLASS 310

91 5,488,259
156 5,488,260
249 5,488,261

CLASS 312

9.46 5,487,599
135 5,487,600
183 5,487,601

CLASS 313

141 5,488,262
402 5,488,263
412 5,488,264
414 5,488,265
509 5,488,266

CLASS 315

63 5,488,267
70 5,488,268
307 5,488,269
370 5,488,270
5,488,271
408 5,488,272

CLASS 318

16 5,488,273
101 5,488,274
468 5,488,275
473 5,488,276
587 5,488,277
626 5,488,278
801 5,488,279
805 5,488,280
806 5,488,281

CLASS 320

14 5,488,282
15 5,488,283
39 5,488,284
46 5,488,285

CLASS 322

10 5,488,286
20 5,488,287

CLASS 323

284 5,488,288
312 5,488,289

CLASS 324

74 5,488,290
96 5,488,291
158.1 5,488,292
202 5,488,293
207.21 5,488,294
248 5,488,295
251 5,488,296
309 5,488,297
5,488,298
318 5,488,299
432 5,488,300
458 5,488,301
509 5,488,303
520 5,488,304
537 5,488,305
539 5,488,306
555 5,488,307
5,488,308
617 5,488,309
648 5,488,310
674 5,488,311
689 5,488,312
754 5,488,313
758 5,488,314

CLASS 326

37 5,488,315
41 5,488,316
45 5,488,317
46 5,488,318
115 5,488,319

CLASS 327

65 5,488,320
66 5,488,321
74 5,488,322
5,488,323
77 5,488,324
286 5,488,325
408 5,488,326
536 5,488,327
538 5,488,328
539 5,488,329

CLASS 330

261 5,488,330
296 5,488,331

CLASS 331

25 5,488,332
66 5,488,333

CLASS 333

22 F 5,488,334
206 5,488,335
252 5,488,336

CLASS 335

202 5,488,337
5,488,338
216 5,488,339
253 5,488,340
302 5,488,341
306 5,488,342

CLASS 336

206 5,488,344
229 5,488,343

CLASS 337

186 5,488,345
198 5,488,346
380 5,488,347

CLASS 338

22 R 5,488,348
171 5,488,349
225 D 5,488,350

CLASS 340

407.1 5,488,351
431 5,488,352
576 5,488,353
5,488,354
578 5,488,355
825.22 5,488,356
825.25 5,488,357
825.31 5,488,358
825.44 5,488,359
933 5,488,360
984 5,488,361

CLASS 341

20 5,488,362
28 5,488,363
50 5,488,364
51 5,488,365
67 5,488,366
106 5,488,367
119 5,488,368
122 5,488,369
161 5,488,370

CLASS 342

1 5,488,371
5 5,488,372
25 5,488,373
5,488,374
26 5,488,375
42 5,488,376
93 5,488,377
352 B1 5,014,066
357 5,488,378
359 5,488,379
368 5,488,380
372 5,488,381

CLASS 343

700 R 5,488,382
912 5,488,383

CLASS 345

1 5,488,384
3 5,488,385
74 5,488,386
89 5,488,387
97 5,488,388
131 5,488,389
145 5,488,390
156 5,488,391
157 5,488,392
213 5,488,393

CLASS 346

141 5,488,394

CLASS 347

7 5,488,395
37 5,488,396
40 5,488,397
43 5,488,398
5,488,399
85 5,488,400
86 5,488,401
96 5,488,402
211 5,488,403
238 5,488,404
254 5,488,405
259 5,488,406
264 5,488,407

CLASS 348

2 5,488,408
5 5,488,409
5.5 5,488,410
8 5,488,411
10 5,488,412
13 5,488,413
207 5,488,414
241 5,488,415
296 5,488,416
379 5,488,417
398 5,488,418
402 5,488,419
419 5,488,420
448 5,488,421
5,488,422
460 5,488,423
559 5,488,425
569 5,488,426
5,488,427
578 5,488,428
653 5,488,429
699 5,488,430
716 5,488,431
717 5,488,432
722 5,488,433
725 5,488,434
751 5,488,436

CLASS 351

45 5,488,438
58 5,488,439
141 5,488,440
156 5,488,441
169 5,488,442
221 5,488,443

CLASS 354

83 5,488,444
106 5,488,445
289.1 5,488,446
298 5,488,447
313 5,488,448
402 5,488,449

CLASS 355

38 5,488,450
77 5,488,451
202 5,488,452
5,488,453
5,488,454
5,488,455
203 5,488,456
5,488,457
206 5,488,458
211 5,488,459
5,488,460
5,488,461
215 5,488,462
233 5,488,464
246 5,488,465
256 5,488,466
282 5,488,467
322 5,488,463

CLASS 356

4.01 5,488,468
72 5,488,469
138 5,488,470
139.09 5,488,471
5,488,472
317 5,488,473
326 5,488,474
352 5,488,475
354 5,488,476
359 5,488,477
376 5,488,478
402 5,488,479
429 5,488,480

CLASS 358

319 5,488,481
339 5,488,482
426 5,488,483
433 5,488,484
444 5,488,485
451 5,488,486
456 5,488,487
468 5,488,488
474 5,488,489
487 5,488,490
501 5,488,491
518 5,488,492

CLASS 359

13 5,488,493
22 5,488,494
56 5,488,495
63 5,488,496
74 5,488,497
88 5,488,498
102 5,488,499
127 5,488,500
137 5,488,501
205 5,488,502
245 5,488,503
248 5,488,504
292 5,488,505
341 5,488,506
344 5,488,507
362 5,488,508
385 5,488,509
478 5,488,510
586 5,488,511
646 5,488,512
699 5,488,513
811 5,488,514

855 5,488,515

CLASS 360

51 5,488,516
53 5,488,517
67 5,488,518
77.03 5,488,519
77.12 5,488,520
97.02 5,488,521
99.06 5,488,522
99.12 5,488,523
103 5,488,524
104 5,488,525
106 5,488,526
122 5,488,527
126 5,488,528
128 5,488,529

CLASS 361

6 5,488,530
18 5,488,531
5,488,533
56 5,488,534
63 5,488,532
119 5,488,535
253 5,488,536
684 5,488,537
685 5,488,538
720 5,488,539
788 5,488,541
793 5,488,542
794 5,488,540
829 5,488,543

CLASS 362

32 5,488,545
34 5,488,544
61 5,488,546
66 5,488,547
249 5,488,548
252 5,488,549
298 5,488,550

CLASS 363

20 5,488,551
21 5,488,552
5,488,553
25 5,488,554

CLASS 364

148 5,488,560
165 5,488,561
424.05 5,488,555
5,488,556
5,488,562
426.02 5,488,557
449 5,488,558
5,488,559
461 5,488,563
474.16 5,488,564
483 5,488,565
488 5,488,566
497 5,488,567
514 R 5,488,568
5,488,569
5,488,570
5,488,572
578 5,488,573
705.07 5,488,571
707 5,488,575
724.01 5,488,576

CLASS 365

49 5,488,578
185 5,488,579
189.05 5,488,580
5,488,581
5,488,582
201 5,488,583
203 5,488,584
210 5,488,585
218 5,488,586
222 5,488,587

CLASS 366

81 5,487,602
141 5,487,603
225 5,487,604
300 5,487,605
339 5,487,606

CLASS 367

7 5,488,588
131 5,488,589

CLASS 369

13 5,488,590
5,488,591
5,488,592
32 5,488,593
44.14 5,488,594
54 5,488,595
71 5,488,596
100 5,488,597
112 5,488,599
116 5,488,600
120 5,488,598
5,488,601
126 5,488,602
219 5,488,603
275.2 5,488,604
291 5,488,605

CLASS 370

16 5,488,606
17 5,488,607
82 5,488,610
84 5,488,609
85.13 5,488,608
108 5,488,611

CLASS 371

22.2 5,488,612
22.3 5,488,613
5,488,614
22.4 5,488,615
30 5,488,616
37.1 5,488,617
67.1 5,488,618

CLASS 372

12 5,488,619
18 5,488,620
31 5,488,621
33 5,488,622
36 5,488,623
41 5,488,624
50 5,488,625
70 5,488,626

CLASS 374

158 5,487,607

CLASS 375

13 5,488,648
204 5,488,627
206 5,488,629
5,488,630
5,488,631
239 5,488,628
260 5,488,632
262 5,488,633
340 5,488,635
5,488,636
341 5,488,637
347 5,488,638
355 5,488,639
357 5,488,640
374 5,488,641

CLASS 376

272 5,488,642
313 5,488,634
390 5,488,643
441 5,488,644

CLASS 377

20 5,488,645
47 5,488,646

CLASS 379

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88 5,488,652
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270 5,488,673
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539 5,487,613

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286 5,487,623

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884 5,487,686

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85 5,487,703

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24 5,487,704

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29 5,487,705
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		5,487,726	5,487,576	5,488,033		5,488,582		5,487,449		5,487,724
		5,488,290	5,487,581	5,488,034		5,488,586		5,487,451		5,487,729
02	:	5,487,444	5,487,590	5,488,091		5,488,608		5,487,482		5,487,738
04	:	5,487,189	5,487,592	5,488,131		5,488,619		5,487,486		5,487,772
		5,487,194	5,487,601	5,488,160		5,488,620		5,487,499		5,487,798
		5,487,305	5,487,607	5,488,161		5,488,622		5,487,511		5,487,871
		5,487,323	5,487,608	5,488,196		5,488,631		5,487,602		5,487,961
		5,487,355	5,487,615	5,488,204		5,488,654		5,487,613		5,487,989
		5,487,373	5,487,636	5,488,240		5,488,656		5,487,657		5,488,300
		5,487,543	5,487,642	5,488,244		5,488,657		5,487,683		5,488,351
		5,487,559	5,487,643	5,488,250		5,488,659		5,487,711		5,488,359
		5,487,566	5,487,645	5,488,252		5,488,668		5,487,854		5,488,408
		5,487,679	5,487,647	5,488,275		5,488,681		5,487,925		5,488,496
		5,487,975	5,487,656	5,488,282		5,488,683		5,487,931		5,488,533
		5,488,257	5,487,663	5,488,289		5,488,685		5,488,116		5,488,669
		5,488,320	5,487,670	5,488,297		5,488,694		5,488,198		5,488,691
		5,488,525	5,487,671	5,488,298		5,488,700		5,488,211	13	: 5,487,463
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		5,487,248	5,487,759	5,488,365		5,488,736		5,488,696		5,488,121
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		5,487,258	5,487,787	5,488,374		5,487,412	10	: 5,487,420		5,488,479
		5,487,270	5,487,789	5,488,378		5,487,525		5,487,697		5,488,676
		5,487,273	5,487,791	5,488,382		5,487,571		5,488,085		5,488,721
		5,487,276	5,487,821	5,488,383		5,487,579		5,488,110	15	: 5,487,418
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		5,487,331	5,487,876	5,488,409		5,487,768		5,487,244		5,487,999
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		5,487,399	5,487,895	5,488,411		5,487,897		5,487,326		5,488,583
		5,487,408	5,487,920	5,488,422		5,487,924		5,487,330		5,488,584
		5,487,416	5,487,922	5,488,441		5,488,036		5,487,345	17	: 5,487,201
		5,487,443	5,487,930	5,488,467		5,488,249		5,487,396		5,487,211
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		5,487,497	5,487,972	5,488,508		5,488,522		5,487,467		5,487,259
		5,487,518	5,487,980	5,488,521		5,488,523		5,487,487		5,487,311
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DESIGN PATENTS

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PLANT PATENTS

06	:	9,443			9,444			9,445									

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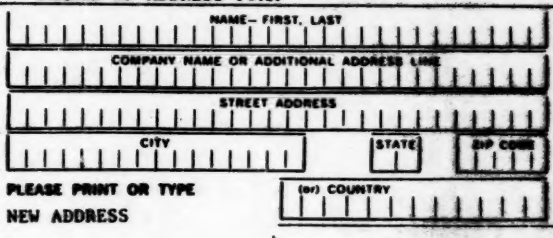

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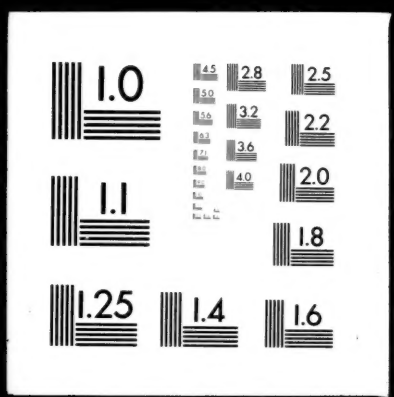
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